SAMSUNG

MICROWAVE OVEN

CM1219 / CM1229

SERVICE Manual

MICROWAVE OVEN

SESC

CONTENTS

1. Precaution

2. Specifications

3. Operating Instructions

4. Disassembly and Reassembly

5. Alignment and Adjustments

6. Troubleshooting

7. Exploded Views and Parts List

8. PCB Circuit Diagrams and Parts List

9. Wiring Diagram & Operating Sequence

PRECAUTIONS TO BE OBSERVED BEFORE AND DURING SERVICING TO AVOID POSSIBLE EXPOSURE TO EXCESSIVE MICROWAVE ENERGY

(a) Do not operate or allow the oven to be operated with the door open.

(b) Make the following safety checks on all ovens to be serviced before activating the magnetron or other microwave source, and make repairs as necessary:

(1) Interlock operation,

(2) proper door closing,

(3) seal and sealing surfaces (arcing, wear, and other damage),

(4) damage to or loosening of hinges and latches,

(5) evidence of dropping or abuse.

(c) Before turning on microwave power for any service test or inspection within the microwave generating compartments, check the magnetron, wave guide or transmission line, and cavity for proper alignment, integrity, and connections.

(d) Any defective or misadjusted components in the interlock, monitor, door seal, and microwave generation and transmission systems shall be repaired, replaced, or adjusted by procedures described in this manual before the oven is released to the owner.

(e) A microwave leakage check should be performed on each oven prior to release to the owner.

1. Precaution

Follow these special safety precautions. Although the microwave oven is completely safe during ordinary use, repair work can be extremely hazardous due to possible exposure to microwave radiation, as well as potentially lethal high voltages and currents.

1-1 Safety precautions (⚠)

1. All repairs should be done in accordance with the procedures described in this manual.
2. Microwave emission check should be performed prior to servicing if the oven is operative.
3. If the oven operates with the door open : Instruct the user not to operate the oven and contact the manufacturer and the centre for devices and radiological health immediately.
4. Notify the Central Service Centre if the microwave leakage exceeds 5 mW/cm^2.
5. Check all grounds.
6. Do not power the microwave oven from a "2-prong" AC cord. Be sure that all of the built-in protective devices are replaced. Restore any missing protective shields.
7. When reinstalling the chassis and its assemblies, be sure to restore all protective devices, including: nonmetallic control knobs and compartment covers.
8. Make sure that there are no cabinet openings through which people--particularly children--might insert objects and contact dangerous voltages. Examples: Lamp hole, ventilation slots.
9. Inform the manufacturer of any oven found to have emmission in excess of 5mW/cm^2. Make repairs to bring the unit into compliance at no cost to owner and try to determine cause.
   Instruct owner not to use oven until it has been brought into compliance.
10. Service technicians should remove their watches while repairing an microwave oven.
11. To avoid any possible radiation hazard, replace parts in accordance with the wiring diagram. Also, use only the exact replacements for the following parts: Primary and door sensing switches, interlock monitor switch.
12. If the fuse is blown by the Interlock Monitor Switch: Replace all of the following at the same time: Primary and door sensing switches, as well as the Interlock Monitor Switch. The correct adjustment of these switches is described elsewhere in this manual. Make sure that the fuse has the correct rating for the particular model being repaired.
13. Design Alteration Warning:
    Use exact replacement parts only, i.e., only those that are specified in the drawings and parts lists of this manual. This is especially important for the Interlock switches. Never alter or add to the mechanical or electrical design of the microwave oven. Any design changes or additions will void the manufacturer's warranty.
14. Always unplug the unit's AC power cord from the AC power source before attempting to remove or reinstall any component or assembly.
15. Never defeat any of the B+ voltage interlocks. Do not apply AC power to the unit (or any of its assemblies) unless all solid-state heat sinks are correctly installed.
16. Some semiconductor ("solid state") devices are easily damaged by static electricity. Such components are called Electrostatically Sensitive Devices (ESDs). Examples include integrated circuits and field-effect transistors.

    Immediately before handling any semiconductor components or assemblies, drain the electrostatic charge from your body by touching a known earth ground.
17. Always connect a test instrument's ground lead to the instrument chassis ground *before* connecting the positive lead; always remove the instrument's ground lead last.
18. When checking the continuity of the switches or transformer, always make sure that the power is OFF, and one of the lead wires is disconnected.
19. Components that are critical for safety are indicated in the circuit diagram or parts list by shading, ⚠ or ⚠ .
20. Use replacement components that have the same ratings, especially for flame resistance and dielectric strength specifications. A replacement part that does not have the same safety characteristics as the original might create shock, fire or other hazards.

1-2 Special High Voltage Precautions

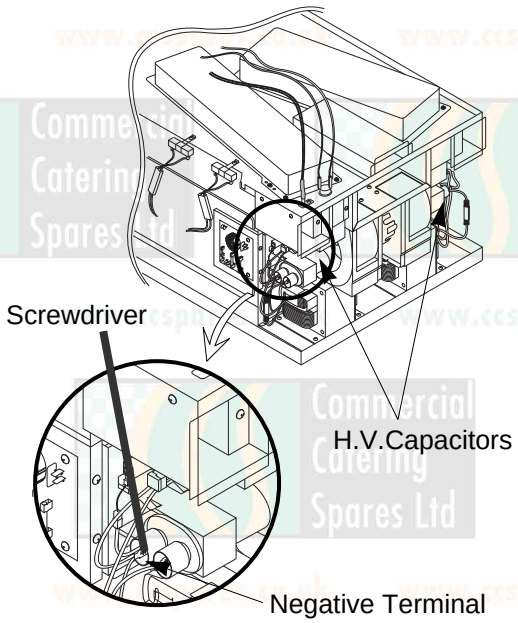
1. High Voltage Warning
   Do not attempt to measureany of the high voltages--this includes the filament voltage of the magnetron. High voltage is present during any cook cycle.

   Before touching any components or wiring, always unplug the oven and discharge the high voltage capacitor (See Figure here)

2. The high-voltage capacitor remains charged about 30 seconds after disconnection. Short the negative terminal of the high-voltage capacitor to the oven chassis. (Use a screwdriver.)

3. High voltage is maintained within specified limits by close-tolerance, safety-related components and adjustments. If the high voltage exceeds the specified limits, check each of the special components.

Discharge the 2 High Voltage Capacitors before servicing !



Note :Touch chassis side first then short to the high voltage capacitor terminal by using a screwdriver.

PRECAUTION

There exists HIGH VOLTAGE ELECTRICITY with high current capabilities in the circuits of the HIGH VOLTAGE TRANSFORMER secondary and filament terminals. It is extremely dangerous to work on or near these circuits with the oven energized.
DO NOT measure the voltage in the high voltage circuit including filament voltage of magnetron.

PRECAUTION

Never touch any circuit wiring with your hand nor with an insulated tool during operation.

PRECAUTION

Servicemen should remove their watches whenever working close to or replacing the magnetron.

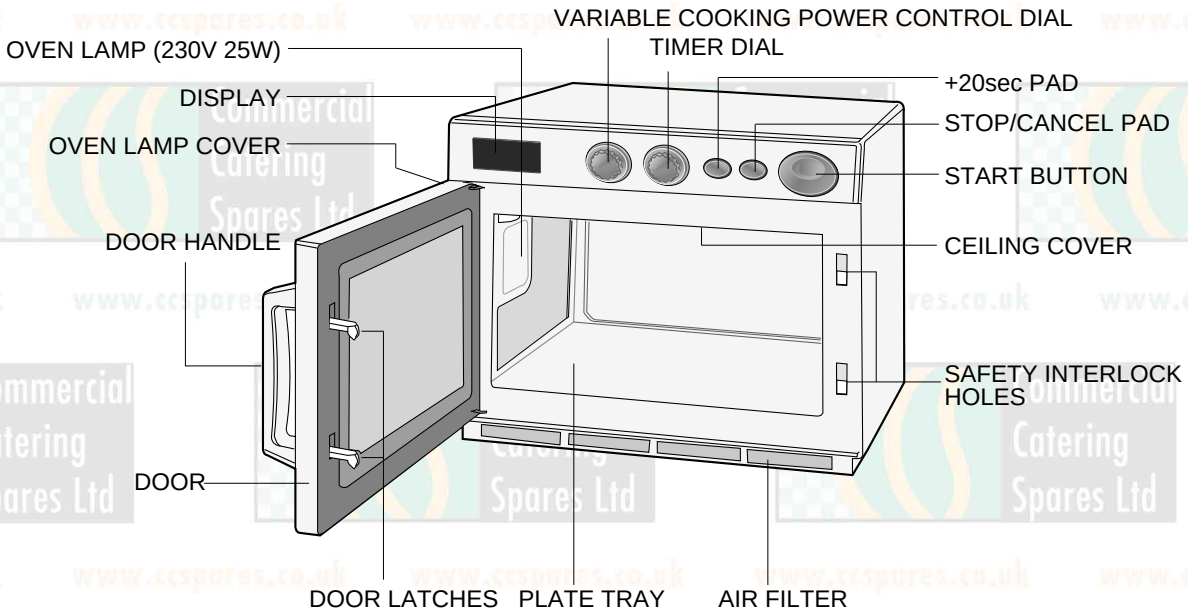
2. Specifications

2-1 Table of Specifications (CM1219 / CM1229)

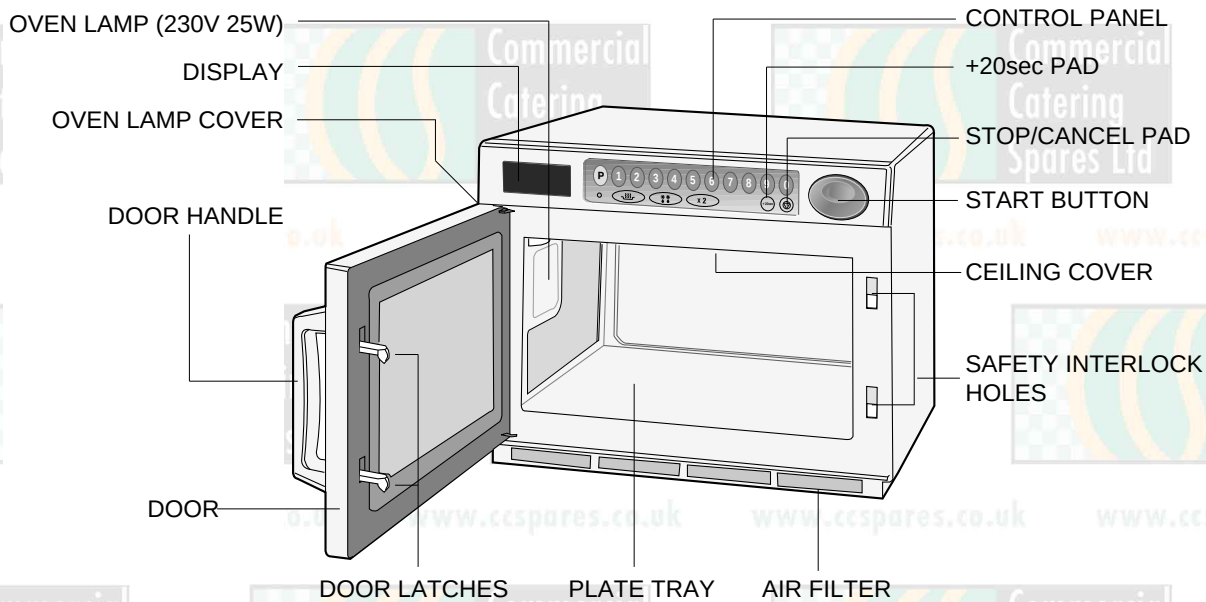
ITEM \ MODEL	CM1219	CM1229
TIMER	Max. 25 min	Max. 25 min
POWER SOURCE	230V/50HZ, AC	230V/50HZ, AC
POWER CONSUMPTION	MICROWAVE : 2,200W	MICROWAVE : 2,200W
OUTPUT POWER	230V: 1,200W (IEC-705)	230V: 1,200W (IEC-705)
OPERATING FREQUENCY	2,450MHz	2,450MHz
MAGNETRON	OM75P(20)ESS	OM75P(20)ESS
COOLING METHOD	VENTILATION MOTOR	VENTILATION MOTOR
OUTSIDE DIMENSIONS	464(W) x 368(H) x 557(D)	464(W) x 368(H) x 557(D)
NET WEIGHT	32 Kg	32 Kg
SHIPPING WEIGHT	34.5 Kg	34.5 Kg

3. Operating Instructions

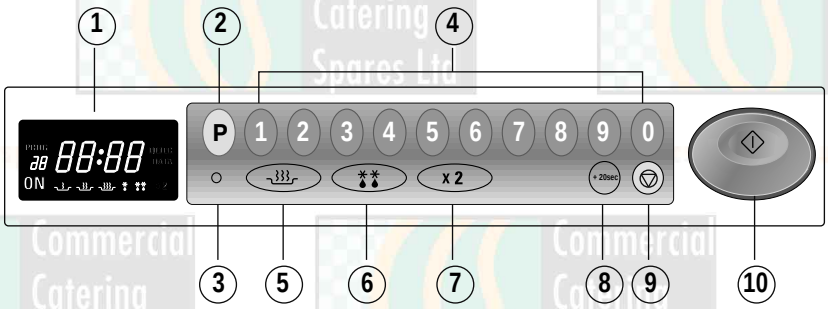
3-1 Features (CM1219)



3-2 Features (CM1229)



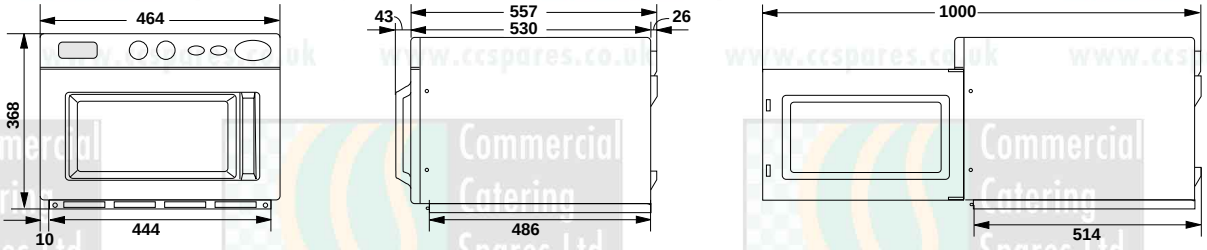
3-3 Control Panel (CM1229)



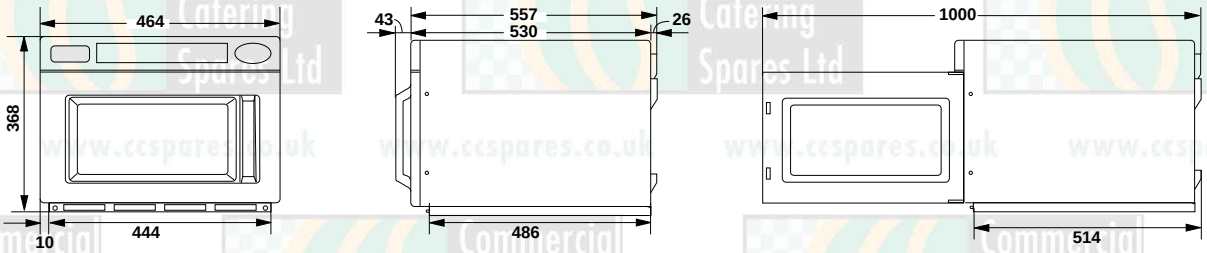
1. DISPLAY
2. PROGRAM PAD
3. PROGRAM LOCK PAD
4. NUMBER PADS(TIME, MEMORY PROGRAMMING)
5. POWER LEVEL SELECTOR PAD
6. DEFROST SELECTOR PAD
7. DOUBLE QUANTITY PAD
8. +20sec PAD (ONE TOUCH COOK PAD)
9. STOP/CANCEL PAD
10. START BUTTON

3-4 External Views (CM1219 / CM1229)

3-4-1 External Views (CM1219)



3-4-2 External Views (CM1229)



3-5 Operation Guide (CM1219)

Cooking/Reheating

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.

2. Open the door.
   The oven lamp will be turned on.

3. Put the food into a suitable container, place it in the center of the oven and then close the door securely.
   Result: The oven lamp will go off.

4. Select the desired power level by rotating the COOKING POWER CONTROL DIAL.
   Result: The selected power level will be displayed in the display window.

5. Set the desired heating time by rotating the TIMER DIAL.
   Result: "ON" blinks and the selected time is displayed in the display window.

6. Press ◇ pad:
   Result: The oven lamp and cooling fan will be turned on.
   Heating will start.
   The time on digital display will count down.

7. When all time is elapsed, the end of cycle Beep Tone will sound 4 times and all heating will stop. The oven lamp will go off. For 1 min, the display shows *0* and the cooling fan will keep working in order to cool down the interior parts. During the time, the fan will not stop even when you open the door. 1 min later it will stop and ON appears again. Food may be removed from oven whilst the fan is still running.

8. Open the door and take the food out.

9. Close the door. The oven lamp will go off.

NOTE: Whilst heating, one press on ▽ pad stops the oven. You can restart it by pressing the ◇ pad or a second press on ▽ pad will cancel the selected program. When it is NOT in a heating cycle, one tap on ▽ pad cancels the selected program. You can set the power level first and then the cooking time next, or vice versa. You can press +20sec button one or more times in order to add the cooking time by 20 seconds.

3-5 Operation Guide (CM1219 continued)

To stop the cooking

You can stop cooking at any time so that you can:

- Check the food
- Turn the food over or stir it
- Leave it to stand

* Temporarily ; Open the door or press ▽ button once.
  Result: Cooking stops. To resume cooking, close the door and press ◇ again.

* Completely ; Press the ▽ button twice.
  Result: The cooking settings are cancelled.

If you want to cancel any cooking settings before starting cooking, simply press ▽ once.

Using the Defrost Feature

The Defrost feature enables you to defrost meat, poultry, fish.

NOTE: Only use containers that are microwave-safe.

1. Open the door.
2. Place the frozen food in the centre of the plate tray.
3. Close the door.
4. Rotate the Variable Cooking Power Control dial to the DEFROST HIGH(⁂) or DEFROST LOW(⁑) as you wish.
   Result: The DEFROST indicator appears on the digital display.

5. Rotate the TIMER dial to set the defrosting time.
   The Maximum time that can be set under defrosting mode is 50min.

6. Press ◇ button.
   Result: Defrosting begins.

3-5 Operation Guide (CM1229)

Cooking/Reheating

NOTE: When you first plug in the power cord, the oven beeps once and all the indicators show for 5 sec in the display window.

NOTE: When heating cycle is completed and you open the door, the oven lamp automatically turns on and goes off 1 min later.

NOTE: When you open the door whilst in a heating cycle, the oven stops operating and the oven lamp automatically turns on for 1 min and goes off 1 min later. If you leave the oven door open for more than 1 min, the oven beeps once every minute and after 5 min the power source check indicator 'ON' appears in the display window.

This oven is preset at the factory for automatic operation.

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.

2. Open the door.
   The oven lamp will be turned on.

3. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   Result: The oven lamp will go off.

4. Select the desired power level by pressing the Power Level Selector pad.
   Result: The selected power level will be displayed in the display window.

5. Set the desired heating time by pressing the Number pads.
   Result: The selected time is displayed in the display window.

6. Press START button:
   Result: The oven lamp and cooling fan will be turned on. Heating will start. The time on digital display will count down.

7. When all time is elapsed, the end of cycle Beep Tone will sound 4 times and all heating will stop. The oven lamp will go off. For 1 min, the display shows *0* and the cooling fan will keep working in order to cool down the interior parts. During the time, the fan will not stop even when you open the door. 1 min later it will stop and 'ON' appears again. Food may be removed from oven whilst the fan is still running.

8. Open the door and take the food out.

9. Close the door. The oven lamp will go off.

3-5 Operation Guide (CM1229 continued)

Using the Defrost Feature

NOTE: When the oven was operating for longer than 25 min under Defrosting cycle, you can NOT change the power level from Defrosting to Heating(Cooking/Reheating) mode.
NOTE: The oven is designed not to work when power level is set to '0' mode between the heating mode and the defrosting mode.

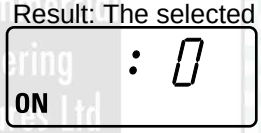
* Use only containers that are microwave-safe.

1. Open the door.

2. Place the frozen food in the centre of the plate tray.

3. Close the door.

4. Press the Defrost selector pad to set DEFROST HIGH (⁑) or DEFROST LOW (⁑) as you wish.
Result: The selected DEFROST indicator appears in the display.



5. Press the Number pads to set the defrosting time. (Max. 50 min)

6. Press ◇ button.
Result: Defrosting begins.

NOTE: It is not possible to set a defrosting time for longer than 50min. The defrost indicator will flash and it is advisable to press CANCEL and enter a new defrost level and time.

Repeat Feature

You can repeat the previous cooking setting (regardless of manual or automatic memory heating) by pressing the START button. The oven starts with exactly the same heating time and power level that were used in the last operation.
NOTE: Repeat feature does not support for +20sec pad. The repeat feature will be cancelled once the power source is cut off.

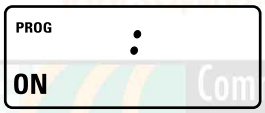
Using +20sec Pad

This is a ONE TOUCH COOK pad.
By touching the +20sec pad once, you can start heating instantly.
You can increase the cooking time by pressing the +20sec pad while heating is being done.
A cooking time increases by 20 seconds at each press on +20sec pad. But it can not exceed the maximum time. Like traditional cooking, you may find that, depending on the food's characteristics or your tastes, you have to adjust the cooking times slightly.
Before operating the oven, times can be increased/decreased using either the time pads or +20sec button. During the operating, time may only be added by using the +20sec button.

3-5 Operation Guide (CM1229 continued)

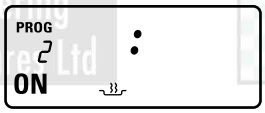
Memory Pads Programming

1. Hold down PROGRAM LOCK pad and then press PROGRAM pad. Hold together for 2 sec.
   Be sure to press the pads firmly.
   Result: PROG indicator appears in the digital display.



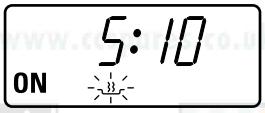
2. Press appropriate NUMBER pad for the desired memory number.
   Result: Selected memory program code appears below the PROGRAM indicator.

3. Select power level by pressing the POWER LEVEL pad.
   Result:Default power level HIGH appears in the display at first press of the POWER LEVEL pad.
   Press the POWER LEVEL pad one or more times until you get the desired power level.



4. Press NUMBER pads to set the cooking time.
   Result: The maximum time according to each cooking power level can be referred to in the title “Power Levels and Time Variations” on page 12~13. The NUMBER pads will not operate or respond when you press a cooking time exceeding the maximum value.

NOTE: It is not possible to set a cooking time for longer than the maximum time allowed on the chosen program. The power level indicator will flash and it is advisable to press CANCEL and to enter a new power level and cooking time.



5. Hold down PROGRAM LOCK pad and then press PROGRAM pad. Hold together for 2 sec once again.
   Result: PROG indicator and memory number indicator blink 3 times in the digital display with a beep sound. And then the display goes blank.
   Caution: Be sure to press the pads firmly in the right position.

6. When you want to program more, repeat the procedures above again.
   Memory programs are available up to 30 items. Make sure the unit is properly programmed.
   After programming is finished, all you have to do for memory cooking is to press the NUMBER pad. Then the selected memory program automatically starts cooking.

3-5 Operation Guide (CM1229 continued)

How to Operate Memory Cooking

After having finished memory programming, just press the NUMBER pad of the memory number you want to select. The oven will automatically start heating according to the pre-programmed cooking time and power level after a short delay (5 sec).

1. Make sure the oven is plugged into a properly earthed electrical outlet and 'ON' appears in the display window.
2. Open the door.
   The oven lamp will be turned on.

3. Put the food into a suitable container, place it in the centre of the oven and then close the door securely.
   Result: The oven lamp will go off.
4. Press NUMBER pad.
   Result: After 2 seconds, the selected memory program automatically starts heating.

Stopping the Cooking

You can stop cooking at any time so that you can:
- Check the food
- Turn the food over or stir it
- Leave it to stand

To stop the cooking;

* Temporarily: Open the door or press ▽ pad once.
  Result: Cooking stops. To resume cooking, close the door and press ◇ again.

* Completely: Press the ▽ pad twice.
  Result: The cooking settings are cancelled.

If you want to cancel any cooking settings before starting cooking, simply press CANCEL pad once.

3-5 Operation Guide (CM1219 / CM1229)

Power Levels and Time Variations

The power level function enables you to adapt the amount of energy dissipated and thus the time required to cook or reheat your food, according to its type and quantity. You can choose between the power levels below.

Power Level	Percentage	CM1219/1229
HIGH( )	100%	1200W
MEDIUM( )	70%	840W
LOW( )	50%	600W
HIGH DEFROST( )	30%	360W
LOW DEFROST( )	15%	180W

You cannot set the cooking time longer than maximum value allowed to each specific power level. (see below.)

Power Level	Max. Time
HIGH	25 min.
MEDIUM	40 min.
LOW	40 min.
HIGH DEFROST	50 min.
LOW DEFROST	50 min.

4. Disassembly and Reassembly

4-1 Replacement of Magnetron

Remove the magnetron including the shield case, permanent magnet, choke coils and capacitors (all of which are contained in one assembly).

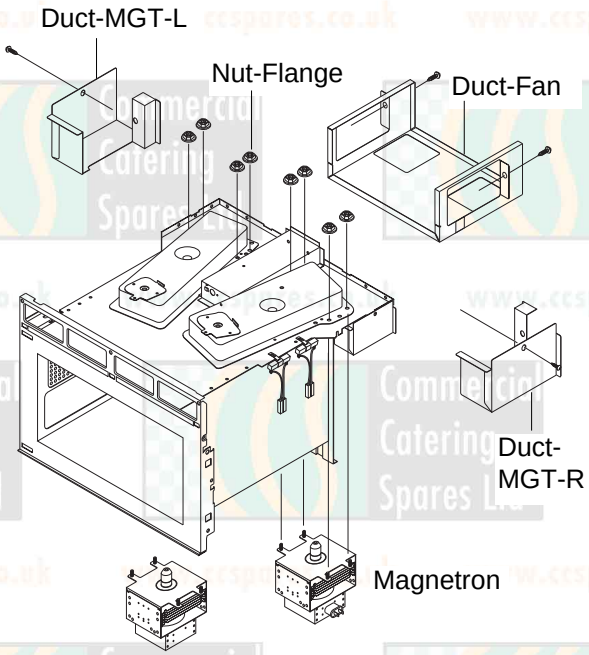
1. Remove the outer panel.

NOTE: Before servicing, make sure to discharge electric charge remaining on the high voltage capacitors or wait for more than 5 min.

2. Remove the back cover.
3. Disconnect all lead wires from the magnetron.
4. Remove screws securing the duct-MGT and duct-fan.
5. Remove the nut-flanges securing the magnetron by using a box wrench.
6. Take out the magnetron very carefully.

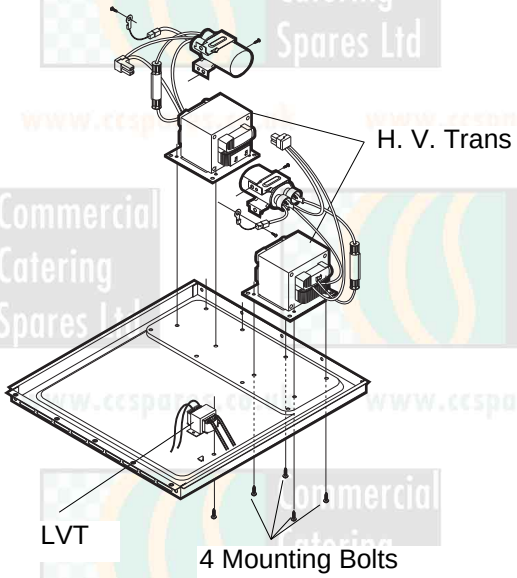
NOTE1: When removing the magnetron, make sure that its antenna does not hit any adjacent parts, or it may be damaged.

NOTE2: When replacing the magnetron, be sure to remount the magnetron gasket in the correct position and make sure the gasket is in good condition. (See page 19 for adjustment instructions.)



4-2 Replacement of High Voltage Transformer

1. Discharge the high voltage capacitor.
2. Disconnect all the leads.
3. Remove the mounting bolts securing the HVT.
4. Reconnect the leads correctly and firmly.



4-3 Replacement of Door Assembly

4-3-1 Removal of Door Assembly

NOTE: Be sure to wear gloves when you disassemble or assemble the parts.

1. Remove hex bolts securing the upper hinge and lower hinge. Then remove the door assembly.
2. Insert the flat screwdriver or thin metal plate into the gap between the door E and door C to remove Door C from the door assembly.
3. Remove 2 screws securing the Door Handle.
4. Unbend the 6 metal tabs around the trim of Decoration Door Cover.
5. Remove 3 screws securing the Door E Ass'y.
6. Remove upper hinge and lower hinge.
7. Remove Decoration Door, Screen B, Key-Door, Spring-Key, Pin-Key as needed.

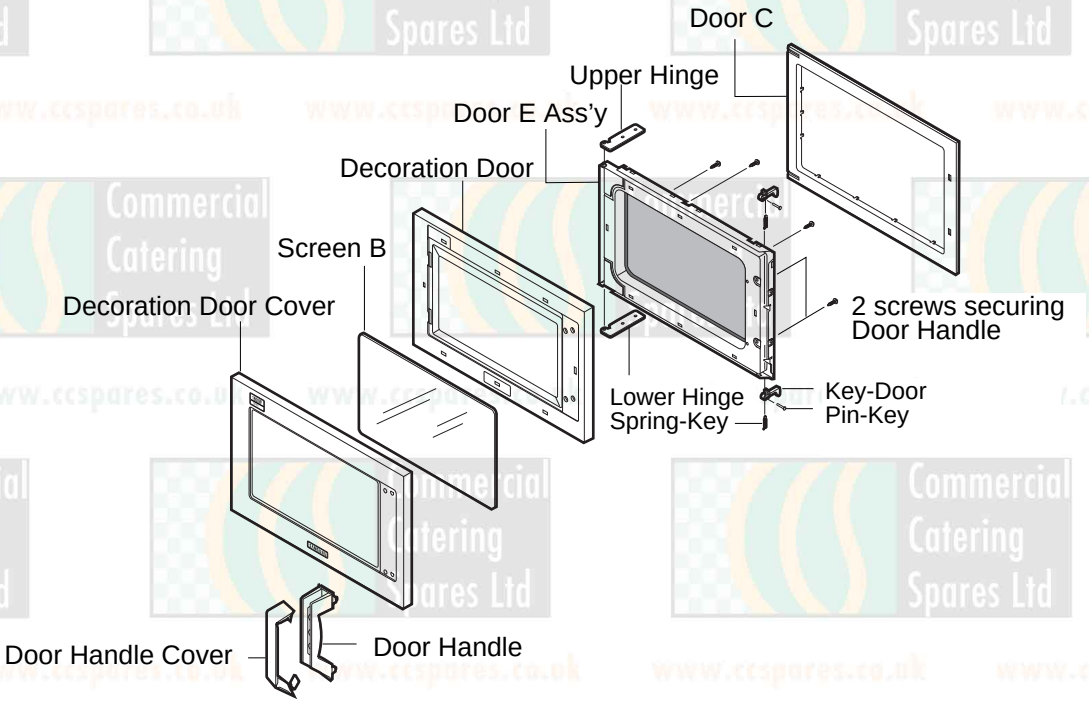
4-3-2 Removal of Door Handle

1. Remove hex bolts securing the upper hinge and lower hinge. Then remove the door assembly.
2. Insert the flat screwdriver or thin metal plate into the gap between the door E and door C to remove Door C from the door assembly.

NOTE: Be careful when handling Door C as is fragile.

NOTE: The thickness of the flat screwdriver or thin metal plate inserted into the gap should be 0.5mm or less.

3. Remove 2 screws securing the Door Handle to the Door E Ass'y.
4. Unbend the 2 metal tabs at both ends of the Door Handle to remove the Door Handle Cover from the Door Handle.



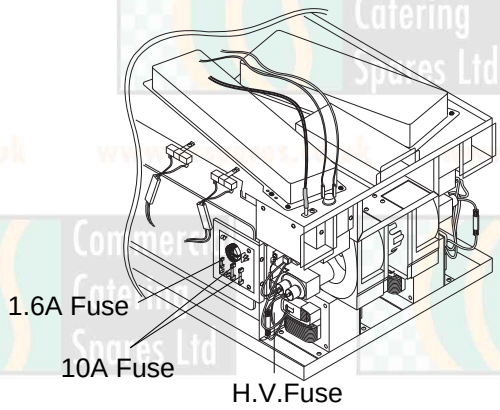
4-3-3 Reassembly Test

After replacement of the defective component parts of the door, reassemble it and follow the instructions below for proper installation and adjustment so as to prevent an excessive microwave leakage.

1. When mounting the door to the oven, be sure to adjust the door parallel to the bottom line of the oven face plate by moving the upper hinge and lower hinge in the direction necessary for proper alignment.
2. Adjust so that the door has no play between the inner door surface and oven front surface. If the door assembly is not mounted properly, microwave energy may leak from the space between the door and oven.
3. Do the microwave leakage test.

4-4 Replacement of Fuse and H.V.Fuse

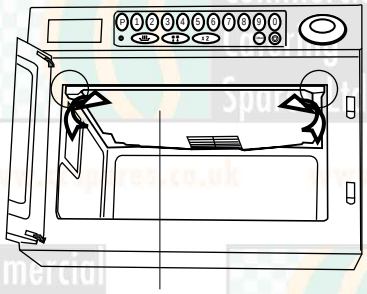
1. Disconnect the oven from the power source.
2. Remove defective fuse from Noise filter.
3. When replacing the fuse, be sure to use an exact replacement part. If new fuse blows out again after replacement, check the primary interlock switch, door sensing switch and interlock monitor switch.
4. When the above three switches operate properly, check if any other part such as the control circuit board, ventilation motor or high voltage transformer is defective.



4-5 Replacement of Drive Motor & Ass'y Stirrer

4-5-1 Replacement of Drive Motor

1. Remove outer panel and back-cover.
2. Disconnect all the lead wires from the drive motor.
3. Remove a screw securing the drive motor.
4. When replacing the drive motor, be sure to remount it in the correct position with the coupler.
5. Connect all the leads to the drive motor.
6. Screw the drive motor to the bracket motor with a screw driver.

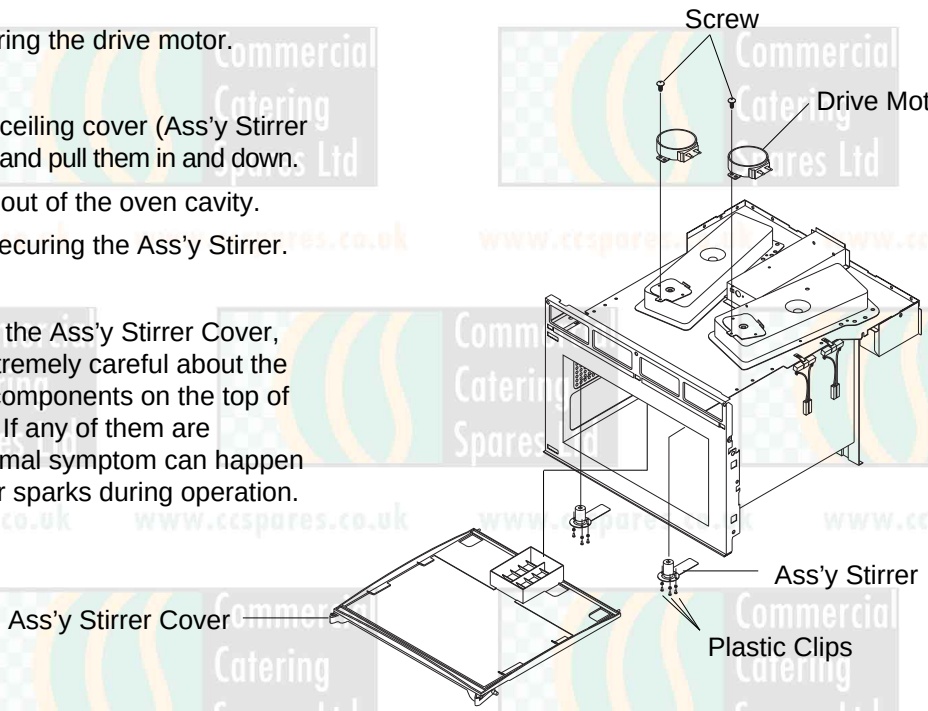


To remove Ass'y Stirrer Cover: Hold side stoppers of ceiling cover with both hands and pull them in and down.

4-5-2 Replacement of Ass'y Stirrer

1. Remove a screw securing the drive motor.
2. Open the door.
3. Hold side stoppers of ceiling cover (Ass'y Stirrer Cover) with both hands and pull them in and down.
4. Take the ceiling cover out of the oven cavity.
5. Remove plastic clips securing the Ass'y Stirrer.

Caution: When removing the Ass'y Stirrer Cover, be sure to be extremely careful about the exposed inside components on the top of the oven cavity. If any of them are deformed, abnormal symptom can happen such as arcing or sparks during operation.



4-6 Replacement of Control Box Ass'y and P.C.Board

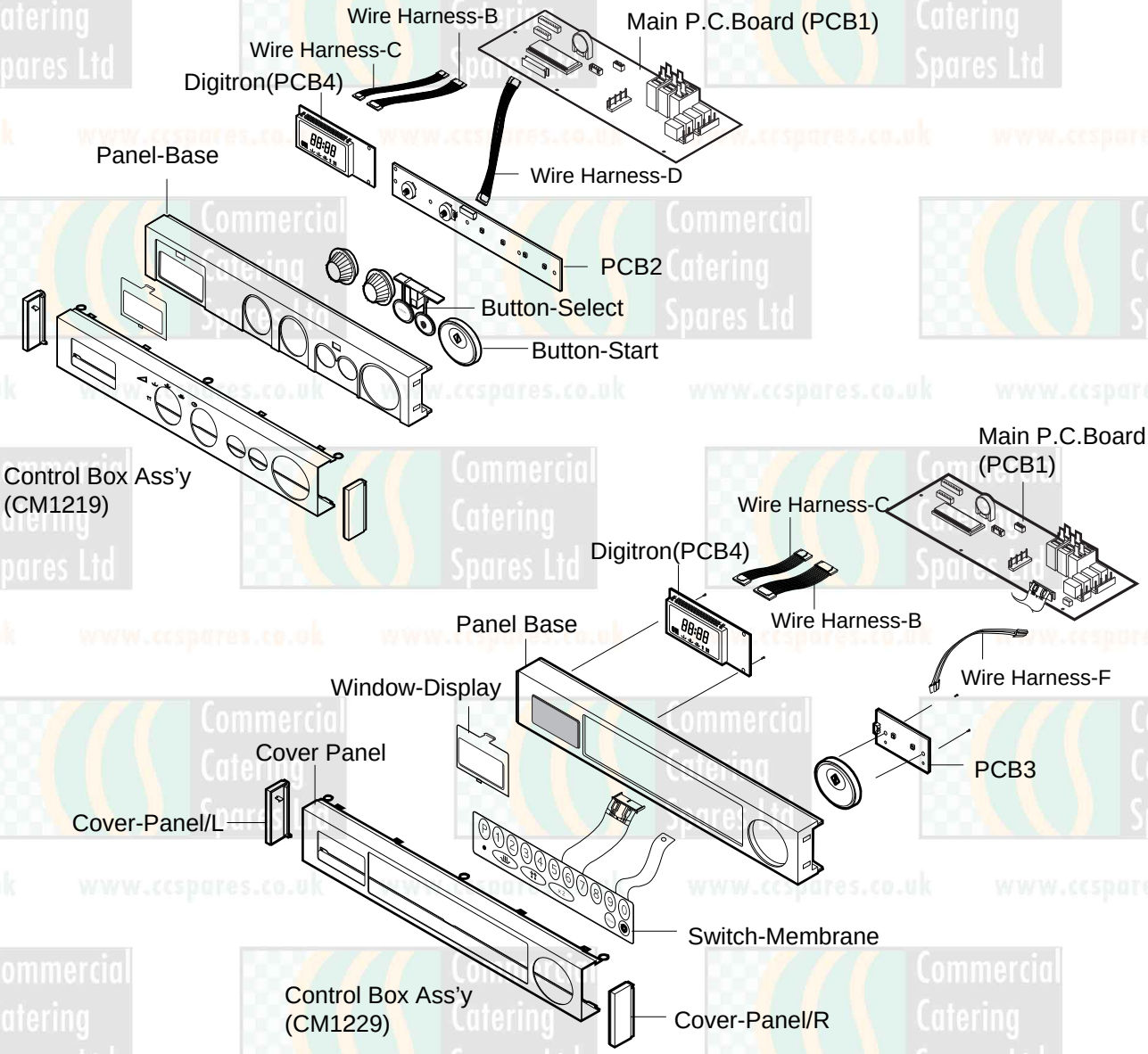
4-6-1 Removal of Control Box Assembly

1. Be sure to discharge any static electric charge built up on your body and avoid touching the touch control circuitry.
2. Remove 3 screws securing the Control Box Ass'y to the oven cavity.
3. Disconnect all the lead wires, connectors and ground taping (CM1229) from the main control circuit board (PCB1).
4. Lift up the FPC connector hooks about 5mm upward which connects to the main control circuit board (PCB1) from the tail of switch membrane of the control box assembly. (CM1229)
5. Remove a screw securing the tapped taping to PCB1. (CM1229)
6. Remove Control Box Ass'y.
7. To replace Digitron, remove 2 screws securing the PCB4.
8. To replace Start Button Circuitry, remove 3 screws securing the PCB3. (CM1229)
9. Unbend the metal tabs holding the Panel-Base to Control Box body.

4-6-2 Removal of main P.C.Board

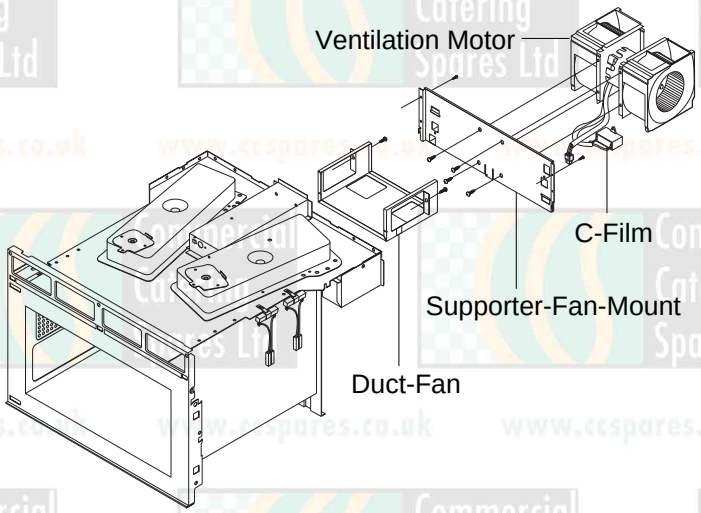
1. Remove Control Box Assembly by following the steps 1~ 5 at left.
2. Remove 4 screws securing the main PCBoard to the bracket PCBoard.

NOTE: When handling the the touch control circuitry, be most careful to avoid damage.



4-7 Replacement of Ventilation Motor

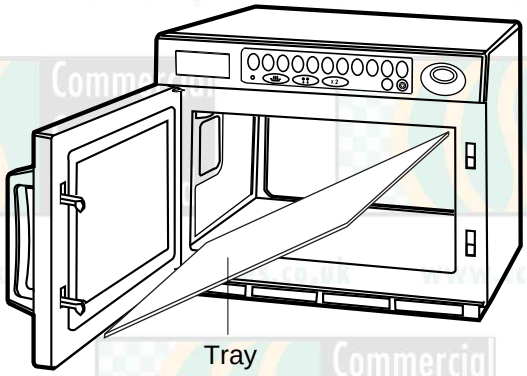
1. Remove the outer panel and back-cover.
2. Discharge the high voltage capacitor.
3. Remove all the lead wires from Magnetron and High Voltage Capacitor.
4. Remove 2 screws securing the duct fan.
5. Remove 2 screws securing the Supporter-Fan-Mount.
6. Lift the Ventilation Motor Ass'y slightly upward and pull it out.
7. Remove lead wires and connectors.
8. Remove a screw securing the C-Film to the Supporter-Fan-Mount.
9. Turn the fan motor ass'y over so that the bracket side is up.
10. Remove 4 screws securing the Ventilation Motor.



4-8 Replacement of Tray

1. Open the door.
2. Remove the tray by inserting a thin metal tool into the gap between the oven wall and the tray silicon cover.
3. Insert the new tray by tilting it across the oven cavity.
4. Firstly fix the front part (refers to the place where the silicon cover is thinner than the other 3 edges) and then place the backward part carefully and firmly.

NOTE: Be careful when you handle the tray since it is fragile.

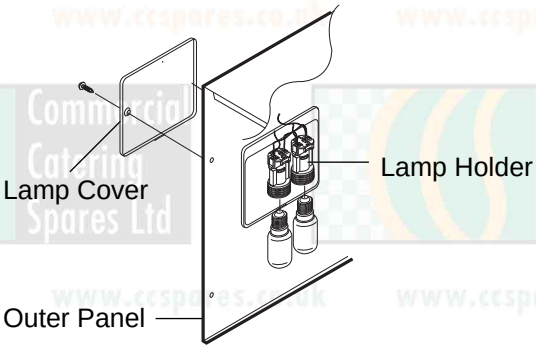


4-9 Replacement of Lamp

NOTE: You don't need to remove the outer panel or other parts in order to replace a lamp.

1. Remove a screw securing the lamp cover.
2. Remove the lamp by rotating it clockwise.
3. Replace with a new lamp by rotating it counter-clockwise.

NOTE : If it is necessary to replace the lamp holder, you can disconnect lead wires by pushing down on the hole of lead wires using a long pointed tool.



4-10 Replacement of Air Filter

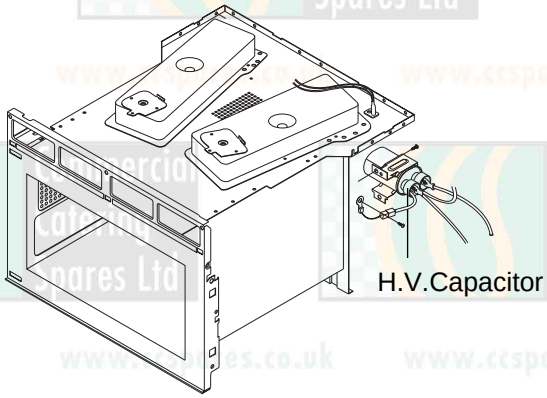
1. Pull out the spacer pins at both ends of the Air Filter. Then the locking clamps inside are released.
2. Lift the Air Filter off the post carefully.

Note: Spacer pins are not detachable from the Air Filter.

4-11 Replacement of High Voltage Capacitor

NOTE: It is not necessary to remove Magnetron in order to remove HVC.

1. Remove the outer panel and back cover.
2. Discharge the high voltage capacitor.
3. Remove HVT wire and H.V.Fuse.
4. Remove screws securing HVC bracket.



5. Alignment and Adjustments

PRECAUTION

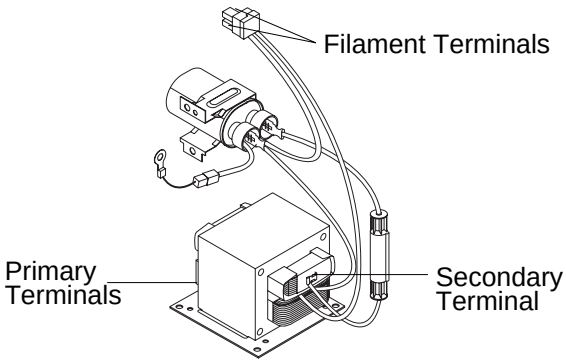
1. High voltage is present at the high voltage terminals during any cook cycle.
2. It is neither necessary nor advisable to attempt measurement of the high voltage.
3. Before touching any oven components or wiring, always unplug the oven from its power source and discharge the high voltage capacitor.

5-1 High Voltage Transformer

1. Remove connectors from the transformer terminals and check continuity.
2. Normal resistance readings are as follows:

Terminal	Resistance
Secondary	Approx. 98Ω
Filament	Approx. 0Ω
Primary	Approx. 1.3Ω

(Room temperature = 20˚C)



5-2 Low Voltage Transformer

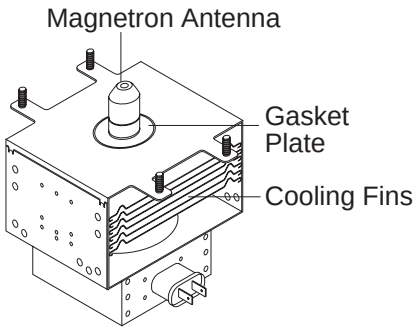
1. The low voltage transformer is located on the base plate.
2. Remove the low voltage transformer from the base plate and check continuity.
3. Normal resistor reading is shown in the table.

Terminals	Resistance	Wire
1~2(input)	Approx. 296Ω	WHT
3~4(output 20V)	Approx. 5.1Ω	RED
5~6(output 3.2V)	Approx. 1.1Ω	YEL

5-3 Magnetron

Continuity checks can indicate only an open filament or a short magnetron. To diagnose an open filament or short magnetron :

1. Isolate the magnetron from the circuit by disconnecting its leads.
2. A continuity check across the magnetron filament terminals should indicate one ohm or less.
3. A continuity check between each filament terminal and magnetron case should read open.



5-4 High Voltage Capacitor

1. Check continuity of the capacitor with the meter set at the highest resistance scale.
2. Once the capacitor is charged, a normal capacitor shows continuity for a short time, and then indicates 9MΩ.
3. A shorted capacitor will show continuous continuity.
4. An open capacitor will show constant 9MΩ.
5. Resistance between each terminal and chassis should read infinite.

5-5 High Voltage Diode

1. Isolate the diode from the circuit by disconnecting its leads.
2. With the ohm-meter set at the highest resistance scale, measure across the diode terminals. Reverse the meter leads and read the resistance. A meter with 6V, 9V or higher voltage batteries should be used to check the front-to back resistance of the diode (otherwise an infinite resistance may be read in both directions). The resistance of a normal diode will be infinite in one direction and several hundred KΩ in the other direction.

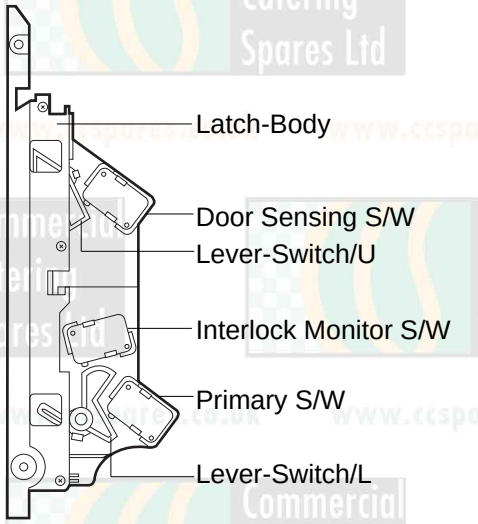
5-6 Main Relay and Power Control Relay

1. The relays are located on the PCB Ass'y. Isolate them from the main circuit by disconnecting the leads.
2. Operate the microwave oven with a water load in the oven. Set the power level to high.
3. Check continuity between terminals of the relays after Start pad is pressed.

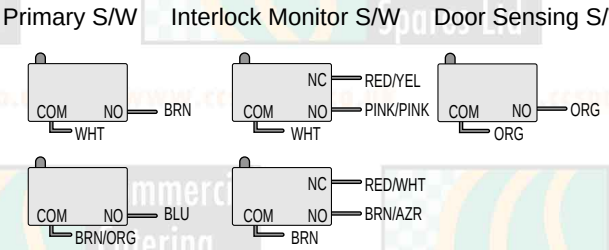
5-7 Adjustment of Primary, Door Sensing and Monitor Switch

Precaution

For continued protection against radiation hazard, replace parts in accordance with the wiring diagram and be sure to use the correct part number for the following switches: Primary and door sensing switches, and the interlock monitor switch (replace all together). Then follow the adjustment procedures below. After repair and adjustment, be sure to check the continuity of all interlock switches and the interlock monitor switch.



1. When mounting Primary switch and Interlock Monitor switch to Latch Body, consult the figure.
   NOTE:No specific adjustment during installation of Primary switch and Monitor switch to the latch body is necessary.
2. When mounting the Latch Body to the oven assembly, adjust the Latch Body by moving it so that the oven door will not have any play in it. Check for play in the door by pulling the door assembly. Make sure that the latch keys move smoothly after adjustment is completed. Completely tighten the screws holding the Latch Body to the oven assembly.
3. Reconnect to Monitor switch and check the continuity of the monitor circuit and all latch switches again by following the components test procedures.
4. Confirm that the gap between the switch housing and the switch actuator is no more than 0.5mm when door is closed.



	Door Open	Door Closed
Primary S/W	∞	0
Monitor S/W(COM-NC)	0	∞
Monitor S/W(COM-NO)	∞	0
Door Sensing S/W	∞	0

5-8 Output Power of Magnetron

CAUTION
MICROWAVE RADIATION

PERSONNEL SHOULD NOT ALLOW EXPOSURE TO MICROWAVE RADIATION FROM MICROWAVE GENERATOR OR OTHER PARTS CONDUCTING MICROWAVE ENERGY.

The output power of the magnetron can be measured by performing a water temperature rise test.
Equipment needed :
* Two 1-liter cylindrical borosilicate glass vessel (Outside diameter 190 mm)
* One glass thermometer with mercury column

NOTE: Check line voltage under load. Low voltage will lower the magnetron output. Make all temperature and time tests with accurate equipment.

1. Fill the one liter glass vessel with water.
2. Stir water in glass vessel with thermometer, and record glass vessel's temperature ("T1", 10±1˚C).
3. After moving the water into another glass vessel, place it in the center of the cooking tray. Set the oven to high power and operate for 26 seconds for CM1219/1229 exactly.
   (3 secondsincluded as a holding time of magnetron oscillation)
4. When heating is finished, stir the water again with the thermometer and measure the temperature ("T2").
5. Subtract T1 from T2. This will give you the water temperature rise. (ΔT)
6. The output power is obtained by the following formula;

$$\text{Output Power} = \frac{4.187 \times 1000 \times \Delta T + 0.88 \times MC \times (T_2 - T_0)}{35}$$

35 : Heating Time (sec)
4.187 : Coefficient for Water
1000 : Water (cc)
ΔT : Temperature Rise (T2-T1)
MC : Cylindrical borosilicate glass weight
T_0 : Room temperature

7. Normal temperature rise for this model is 9˚C to 11˚C at 'HIGH'.
   NOTE 1: Variations or errors in the test procedure will cause a variance in the temperature rise. Additional power test should be made if temperature rise is marginal.
   NOTE 2: Output power in watts is computed by multiplying the temperature rise (step 5) by a factor of 90 times of centigrade temperature.

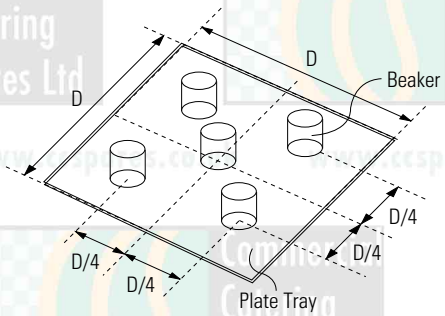
5-9 Microwave Heat Distribution - Heat Evenness

The microwave heat distribution can be checked indirectly by measuring the water temperature rise at certain positions in the oven:

1. Prepare five beakers made of 'Pyrex', having 100 milliliters capacity each.
2. Measure exactly 100milliliters of water load with a measuring cylinder, and pour into each beaker.
3. Measure the temperature of each water load. (Readings shall be taken to the first place of decimals.)
4. Put each beaker in place on the plate tray as illustrated in figure below. Start heating.
5. After heating for 1 minute, measure the water temperature in each beaker.
6. Microwave heat distribution rate can be calculated as follows:

$$\text{Heat Distribution} = \frac{\text{Minimum Temperature Rise}}{\text{Maximum Temperature Rise}} \times 100(\%)$$

The result should exceed 65%.



5-10 Check for Microwave Leakage

5-10-1 Procedure for Measurement of Microwave Energy Leakage

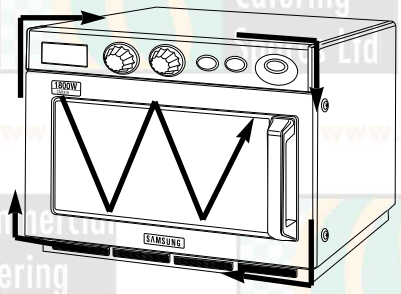
1) Pour 275 ±15cc of 20°C±5°C (68°F±9°F) water in a beaker which is graduated to 600cc, and place the beaker in the center of the oven.
2) Start to operate the oven and measure the leakage by using a microwave energy survey meter.
3) Set survey meter with dual ranges to 2,450MHz.
4) When measuring the leakage, always use the 2 inch spacer cone with the probe. Hold the probe perpendicular to the cabinet door. Place the spacer cone of the probe on the door and/or cabinet door seam and move along the seam, the door viewing window and the exhaust openings moving the probe in a clockwise direction at a rate of 1 inch/sec. If the leakage testing of the cabinet door seam is taken near a corner of the door, keep the probe perpendicular to the areas making sure that the probe end at the base of the cone does not get closer than 2 inches to any metal. If it gets closer than 2 inches, erroneous readings may result.
5) Measured leakage must be less than 4mW/cm2, after repair or adjustment.

5-10-2 Note on Measurement

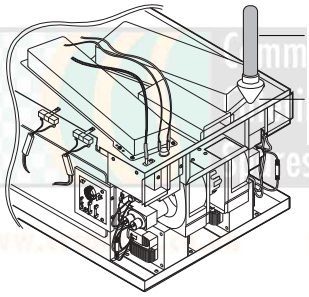
1) Do not exceed the limited scale.
2) The test probe must be held on the grip of the handle, otherwise a false reading may result when the operator's hand is between the handle and the probe.
3) When high leakage is suspected, do not move the probe horizontally along the oven surface; this may cause damage to the probe.
4) Follow the recommendation of the manufacturer of the microwave energy survey meter.

5-10-3 Record keeping and notification after measurement

1) After adjustment and repair of a radiation preventing device, make a repair record for the measured values, and keep the data.
2) If the radiation leakage is more than 4mW/cm² after determining that all parts are in good condition, functioning properly and the identical parts are replaced as listed in this manual, notify that fact to ;
   CENTRAL SERVICE CENTER
3) At least once a year have the microwave energy survey meter checked for accuracy by its manufacturer.



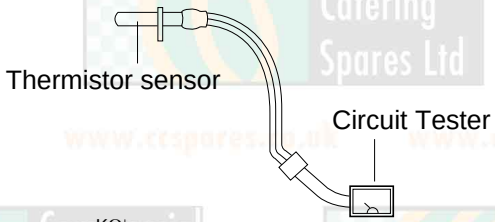
Maximum leakage allowed is 5mW/cm². 4mW/cm² is used to allow for measurement and meter accuracy

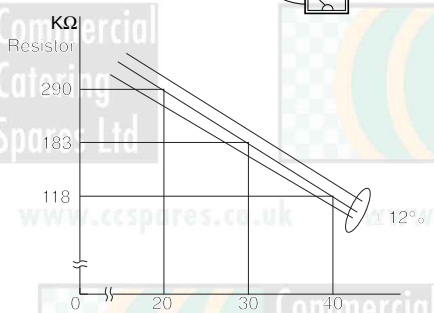


WARNING
AVOID THE HIGH VOLTAGE COMPONENTS.

5-11 Check the Thermistor sensor

If the Thermistor sensor does not fall into range of maximum and minimum, it is fault. (eg. Resistor is 235KΩ ±12% at 25°C. Refer to figure below.)





Thermistor Sensor Temperature

6. Troubleshooting

PRECAUTION

1. CHECK GROUNDING BEFORE CHECKING FOR TROUBLE.
2. BE CAREFUL OF THE HIGH VOLTAGE CIRCUIT.
3. DISCHARGE THE HIGH VOLTAGE CAPACITOR.
4. WHEN CHECKING THE CONTINUITY OF THE SWITCHES OR TRANSFORMER, DISCONNECT LEAD WIRES FROM THESE PARTS AND THEN CHECK CONTINUITY WITHOUT THE POWER SOURCE ON. TO DO OTHERWISE MAY RESULT IN A FALSE READING OR DAMAGE TO YOUR METER.
5. DO NOT TOUCH ANY PART OF THE CIRCUIT OR THE CONTROL CIRCUIT BOARD, SINCE STATIC DISCHARGE MAY DAMAGE IT. ALWAYS TOUCH GROUND WHILE WORKING ON IT TO DISCHARGE ANY STATIC CHARGE BUILT UP.

6-1 Electrical Malfunction

SYMPTOM	CAUSE	CORRECTIONS
Oven is dead. Fuse is OK. No display and no operation.	1. Open or loose lead wire harness 2. Open thermal cutout (magnetron, cavity) 3. Open low voltage transformer 4. Defective Ass'y PCB	Check magnetron or cavity thermal cutout switch is defective. Check Ass'y PCB when LVT is defective.
No display and no operation Fuse blown out. (10A, 1.6A)	1. Shorted lead wire 2. Defective primary latch switch (NOTE1) 3. Defective monitor switch (NOTE1) 4. Shorted HVCapacitor 5. Shorted HVTransformer (NOTE2)	Check adjustment of primary, interlock monitor, door sensing switch.
	NOTE 1: All of these switches must be replaced at the same time. (refer to adjustment instructions) Check continuity of main or power relay contacts and if it has continuity, replace main or power relay also. NOTE 2: When HVTransformer is replaced, check diode and magnetron also.	
Oven does not accept key input (Program) (CM1229)	1. Key input is not in-Sequence 2. Open or loose connection of membrane key pad to Ass'y PCB 3. Shorted or open membrane panel 4. Defective Ass'y PCB	Refer to operation procedure. Replace PCB main.
Timer starts countdown but no microwave oscillation. (No heat while oven lamp and fan motor turn on.)	1. Open or loose connection of high voltage circuit especially magnetron filament circuit NOTE: Large contact resistance will bring lower magnetron filament voltage and cause magnetron to lower output and/or intermittent oscillation. 2. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode, H.V.Fuse Magnetron	Adjust door and latch switches. Check high voltage component according to component test procedure and replace if defective.

6-1 Electrical Malfunction(continued)

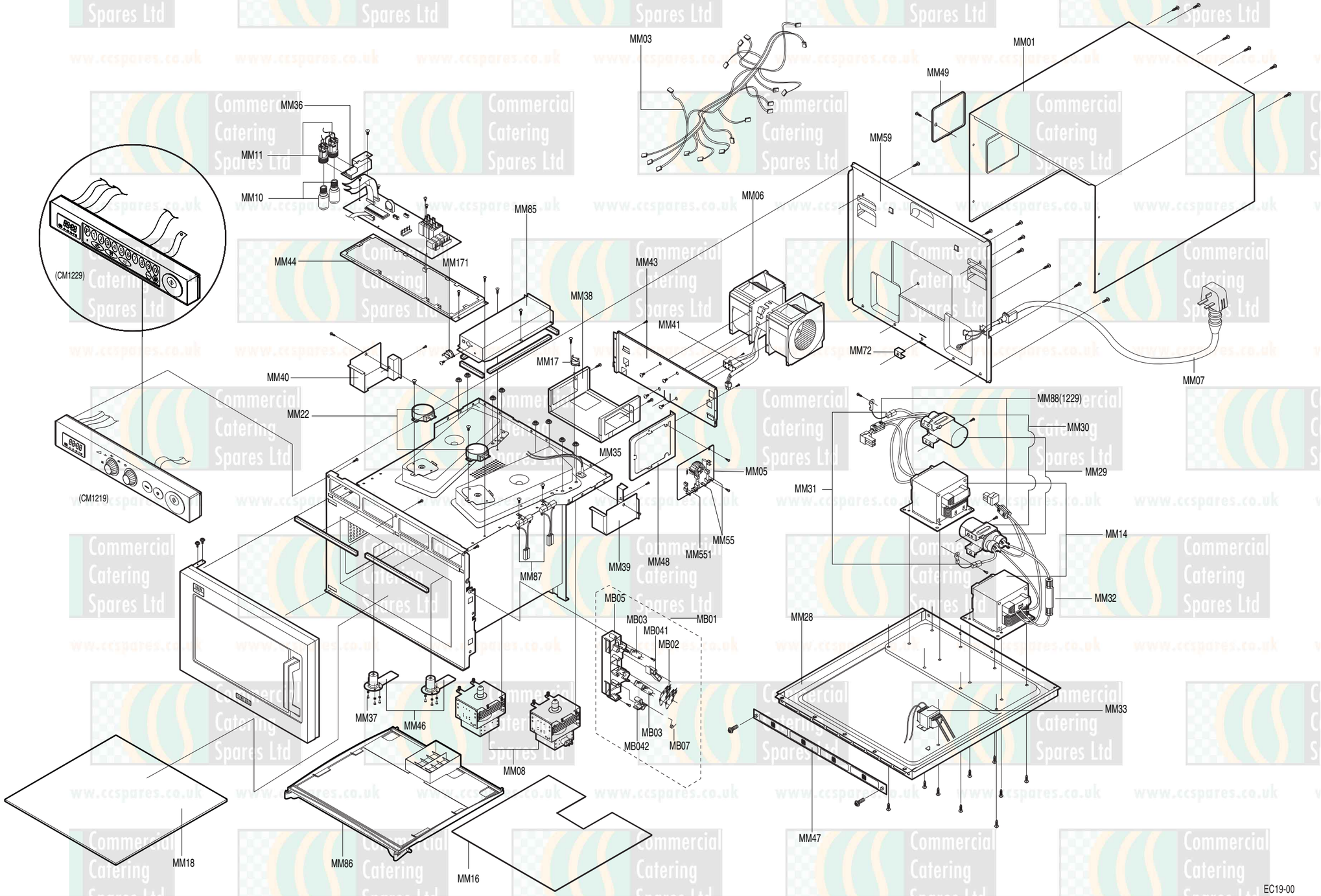
SYMPTOM	CAUSE	CORRECTIONS
Oven lamp goes off	1. Loose lead wire or open lamp filament 2. Misadjustment of latch switch 3. Defective latch switch	Tighten lamp lead wire or replace with a new lamp
Microwave output is low;. Oven takes longer time to cook food. (No heat while oven lamp and ventilation motor.)	1. Decrease in power source voltage. 2. Open or loose wiring of magnetron filament circuit. (Intermittent oscillation) 3. Aging of magnetron 4. Defective high voltage components H.V.Transformer H.V.Capacitor H.V.Diode,H.V.Fuse Magnetron	Consult electrician. Check high voltage component according to component test procedure and replace if defective.
Oven does not operate and return to plugged-in mode.	Defective Ass'y PCB	Replace Ass'y PCB.
Loud buzzing noise can be heard.	1. Loose fan and ventilation motor 2. Loose screws on H.V.Transformer 3. Shorted H.V.Diode 4. Loose or missing screws on Cover-Back	Tighten screws of ventilation motor. Tighten screws of H.V.Transformer. Replace H.V.Diode. Tighten screws of Cover-Back
Drive motor not work. (Assy stirrer does not rotate.)	1. Open or loose wiring of drive motor. 2. Defective drive motor. 3. Defective ass'y stirrer	Check the wire of drive motor Replace drive motor. Replace ass'y stirrer.
Oven stops operating during cooking.	1. Operation of thermal cutout (Magnetron or Cavity) 2. Ventilation motor does not rotate.	Adjust door and latch switches. Replace ventilation motor.
Sparks	1. Metallic ware or cooking dishes touching on the oven wall. 2. Ceramic ware trimmed with gold or silver powder also causes sparks.	Inform the customer of proper use. Do not use any type of cookware with metallic trimming.
Uneven cooking	Uneven intensity of microwave due to its characteristics.	Wrap thinner parts of the food with aluminum foil. Use plastic wrap or cover with a lid. Stir once or twice while cooking foods such as soup, cocoa, or milk.
Noise from turntable motor when it starts to operate.	Noise may result from the motor.	Replace turntable motor.
Oven can program but timer does not start.	Defective circuitry of Start function of Main PCB Ass'y. Loose lead wires	Check circuitry of Start function of Main PCB Ass'y and replace if defective. Adjust or repair loose wires.

6-2 Error Codes & Corrections

Code	Cause	Corrections
E1	1. Improper input power frequency 2. Defective Ass'y Main PCB	Check if power frequency is 50Hz. Replace Ass'y Main PCB or MICOM.
E21	1. Thermistor sensor failure 2. Thermistor sensor open 3. Loose connector CN2	Check resistance of thermistor sensor and replace if defective. Check the circuitry around thermistor sensor.
E22	1. Thermistor sensor failure 2. Thermistor sensor short 3. Thermistor sensor wire short	Check resistance of Thermistor sensor and replace if defective. If Thermistor sensor is short, replace. Check the circuitry around Thermistor sensor.
E3	1. Overheating inside cavity (no load or little load aging) 2. Air ventilation blocked around exhaust area 3. Ventilation motor failure and magnetron overheating	Check if the oven was operating without load or too little load and plug the power cord in again. If error code 'E3' appears again in the window display, check resistance of Thermistor sensor and replace if defective. Check if any blocking amterials exist around the Air Exhaust or ventilation openings and follow the instructions above. Check if the ventilation motor is operative and replace the motor if defective.
E41	1. Main Relay (RY1) or Power Relay (RY2) failure 2. Loose lead wires of relay 3. Primary or Monitor S/W failure 4. Loose lead wires of Primary or Monitor S/W 5. H.V.Trans input power sensing circuitry failure	Check Main Relay (RY1), Power Relay (RY2) Primary S/W and Monitor S/W and replace if defective. Check if lead wires are loosened and connect firmly if loose. Check the circuitry and replace if defective. (Refer to Operating Sequence as shown in page 42.)
E42	1. Power Relay (RY5) failure 2. Loose lead wires of Power Relay (RY5) 3. Primary or Monitor S/W failure 4. Loose lead wires of Primary or Monitor S/W 5. Fuse(10A) blown out on neutral area of Ass'y Noise Filter 6. H.V.Trans input power sensing circuit failure	Check Power Relay2, Primary S/W, Monitor S/W or Fuse and replace if defective. Check if lead wires are loosened and repair as necessary. Check the circuitry. (Refer to Operating Sequence as shown in page 42.)
E5 CM1229	1. Memory IC (EEPROM IC) failure 2. MICOM failure	Check Memory IC (IC3) and replace if defective. Replace Assy Main PCB or MICOM.

7. Exploded Views and Parts List

7-1 Exploded Views



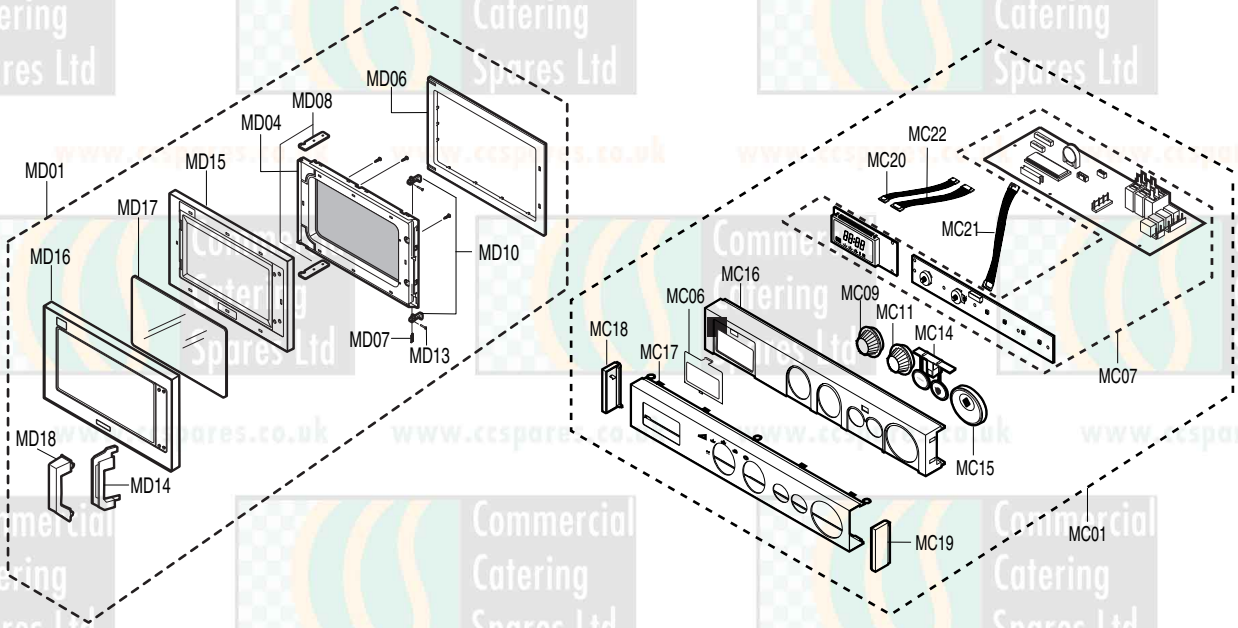
7-2 Main Parts List(CM1219)

No.	Part Code	Description	Specification	Q'ty	Remark
MB01	DE93-20097C	ASSY BODY LATCH	CM1819/1829,EUROPE,-,-,-,-	1	-
MB02	3405-000175	SWITCH-MICRO	250V,15A,200gf,SPST-NO	2	-
MB03	3405-000178	SWITCH-MICRO	250V,15A,200gf,SPST-NO	3	-
MB041	DE66-90107A	LEVER-SWITCH/U	PBT,CM-1819,-,-,-,-,-	1	-
MB042	DE66-90108A	LEVER-SWITCH/L	PBT,CM-1819,-,-,-,-,-	1	-
MB05	DE66-40062A	LATCH-BODY	PP,CM-1819,-,-,-,-	1	-
MB07	DE61-00066A	SPRING-Q	MSWR,PI0.8,-,-,-,-,CM1819/1829,-	1	-
MM01	DE70-30123A	PANEL-OUTER	STS430,T0.6,CM-1819,-,-,-,-,-,	1	-
MM03	DE39-00025A	WIRE HARNESS-A	-,-,-,-,CM1819	1	-
MM05	DE91-40105A	ASSY NOISE FILTER	SN-1829,230V/50Hz,-,-,-,-,-	1	-
MM06	DE91-50093G	ASSY MOTOR-FAN	-,240V,2250RPM,CM1219/1229,-,-	1	-
MM07	DE39-20143B	ASSY POWER CORD	U13A1,-,250V,13A,L2200,BLK,-,-	1	-
MM08	OM75P(20)ESS	ASSY-MAGNETRON	OM75P(20)ESS	2	-
MM10	4713-000168	LAMP-INCANDESCENT	230V,-,25W,ORG,-,-,-	2	-
MM11	DE47-40029A	SOCKET-LAMP	250V2A,22.23,E14,BJB,-,-,-	2	-
MM14	DE26-10150A	TRANS-H.V	SHV-906BG1,240V,2360V/3.35V,50	2	-
MM16	DE71-60424A	COVER-CEILING	MICA_SHEET,T0.5,W348,L319,CM-1	2	-
MM17	DE47-20017A	THERMOSTAT	PW-2N(150/60,187Z),250V/7.5A,1	1	-
MM171	DE47-20197A	THERMOSTAT	NT-101NA(8XV)P,100/60,250V/7.5	1	-
MM18	DE92-90488A	ASSY-TRAY CERAMIC	CM-1819,-,-,-,-,-	1	-
MM22	DE31-10164B	MOTOR-SYNCHRONOUS	M2CK34A709-H(B),120V60HZ,34.9r	2	-
MM28	DE80-10113C	BASE-PLATE	SECC1,-,-,-,CM1819,-	1	-
MM29	2501-001114	C-OIL	740nF,201KV,BK,54X35X65mm,20mm	2	-
MM30	DE61-50120A	BRACKET-HVC	SECC,T0.6,W62,L72,-,-,-	2	-
MM31	DE91-70063A	ASSY-HVD	V2M6,P19.0,0.05MT,-,-,-,-,-	2	-
MM32	DE91-70061C	ASSY-H.V.FUSE	THV060T-0700-H,5KV/0.70A,BLU	2	-
MM33	DE26-20162A	TRANS-L.V	SLV-1829E,230,19.7/3.1V,50Hz,4	1	-
MM35	DE32-10013A	SENSOR-THERMISTOR	PT-312-K2,-,-,-,-,-,-	1	-
MM36	DE61-90318A	HOLDER-LAMP	SECC,T0.8,W134,L40.5,-,-,-,-,-	1	-
MM37	DE69-90054A	CLIP-STIRRER	PFA,5mm,CM1819/29,-,-,-	6	-
MM38	DE72-50088A	DUCT-FAN	ALCOAT,T0.5,CM-1819,-,-,-,-,-,	1	-
MM39	DE72-50089A	DUCT-MGT/R	SECC,T0.5,CM-1819,-,-,-,-,-,-	1	-
MM40	DE72-50090A	DUCT-MGT/L	SECC,T0.5,-,-,-,CM-1819,-	1	-
MM41	2301-001204	C-FILM,PEF	1.50uF,-5to+10%,450VAC,-,48x17	1	-
MM43	DE61-30189A	SUPPORTER-FAN-MOUNT	SECC,T1.0,CM-1819,-,-,-,-	1	-
MM44	DE61-50520A	BRACKET-PCB	SECC,T0.8,CM-1819,-,-,-,-	1	-
MM46	DE92-90515A	ASSY-STIRRER	CM-1819,CM-1829,-,-,-,-	2	-
MM47	DE92-90516B	ASSY-BRACKET FILTER	CM1819,-,-,-,-,-	1	-
MM48	DE61-50568A	BRACKET-SUPPORT	SECC/ALCOAT,T0.6,W100,L100,-,C	1	-
MM49	DE71-60422A	COVER-LAMP	STS430,T0.6,CM-1819,-,-,-,-,-,	1	-
MM55	3601-000448	FUSE-CARTRIDGE	250V,10A,SLOW-BLOW,CERAMIC,6.35	2	-
MM551	3601-001126	FUSE-CARTRIDGE	250V,1.6A,FAST-ACTING,CERAMIC,5x	1	-
MM59	DE71-60421A	COVER-BACK	SECC,T0.6,W481.8,L363.9,CM-181	1	-
MM72	DE61-50541A	BRACKET-EARTH	SGCC2,T1.0,W15,L8,-,-,-	1	-
MM85	DE72-50091A	DUCT-OVEN	STS430,T0.4,CM-1819,-,-,-,-,-,	1	-
MM86	DE71-60423A	COVER-STIRRER	PP,CM-1819,-,-,-,-,-,-,-	1	-
MM87	DE93-90112A	ASSY-B/RESISTOR	CM1819/29,-,-,-,-,-	2	-

7-3 Main Parts List(CM1229)

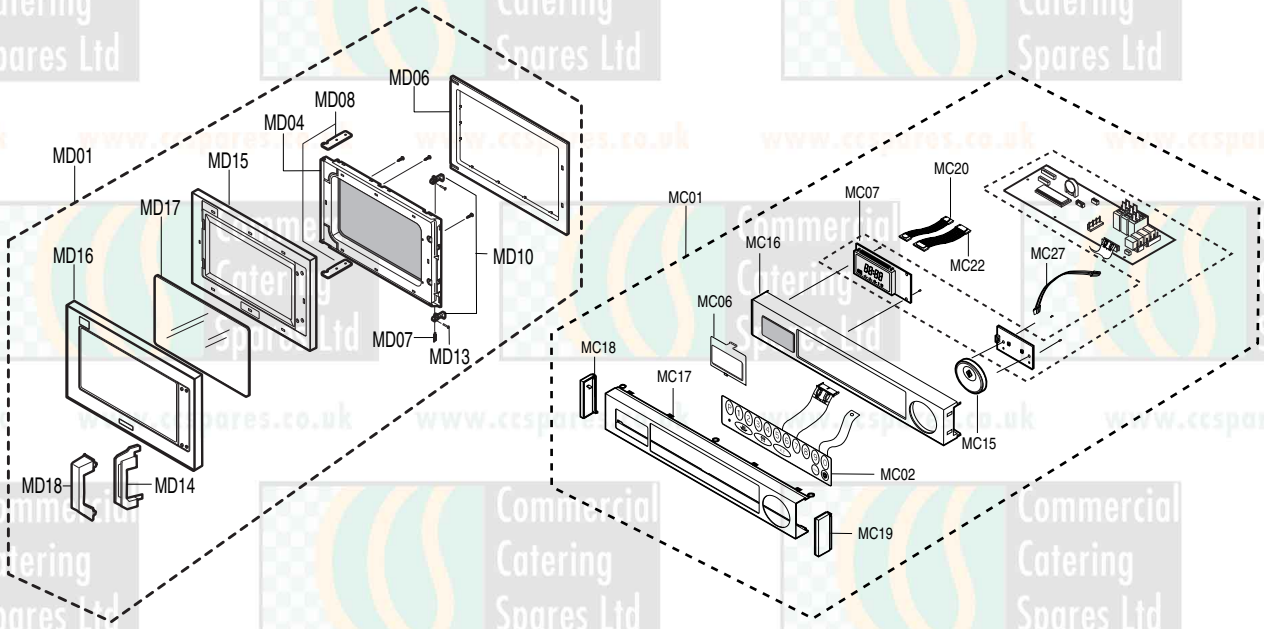
No.	Part Code	Description	Specification	Q'ty	Remark
MB01	DE93-20097C	ASSY BODY LATCH	CM1819/1829,EUROPE,-,-,-	1	-
MB02	3405-000175	SWITCH-MICRO	250V,15A,200gf,SPST-NO	2	-
MB03	3405-000178	SWITCH-MICRO	250V,15A,200gf,SPST-NO	3	-
MB041	DE66-90107A	LEVER-SWITCH/U	PBT,CM-1819,-,-,-,-,-	1	-
MB042	DE66-90108A	LEVER-SWITCH/L	PBT,CM-1819,-,-,-,-,-	1	-
MB05	DE66-40062A	LATCH-BODY	PP,CM-1819,-,-,-,-	1	-
MB07	DE61-00066A	SPRING-Q	MSWR,PI0.8,-,-,-,-,CM1819/1829,-	1	-
MM01	DE70-30123A	PANEL-OUTER	STS430,T0.6,CM-1819,-,-,-,-,	1	-
MM03	DE39-00025A	WIRE HARNESS-A	-,-,-,-,CM1819	1	-
MM05	DE91-40105A	ASSY NOISE FILTER	SN-1829,230V/50Hz,-,-,-,-	1	-
MM06	DE91-50093G	ASSY MOTOR-FAN	-,240V,2250RPM,CM1219/1229,-,-,-,-,-	1	-
MM07	DE39-20143B	ASSY POWER CORD	U13A1,-,250V,13A,L2200,BLK,-,-	1	-
MM08	OM75P(20)ESS	ASSY-MAGNETRON	OM75P(20)ESS	2	-
MM10	4713-000168	LAMP-INCANDESCENT	230V,-,25W,ORG,-,-,-	2	-
MM11	DE47-40029A	SOCKET-LAMP	250V2A,22.23,E14,BJB,-,-,-	2	-
MM14	DE26-10150A	TRANS-H.V	SHV-906BG1,240V,2360V/3.35V,50	2	-
MM16	DE71-60424A	COVER-CEILING	MICA_SHEET,T0.5,W348,L319,CM-1	2	-
MM17	DE47-20017A	THERMOSTAT	PW-2N(150/60,187Z),250V/7.5A,1	1	-
MM171	DE47-20197A	THERMOSTAT	NT-101NA(8XV)P,100/60,250V/7.5	1	-
MM18	DE92-90488A	ASSY-TRAY CERAMIC	CM-1819,-,-,-,-,-	1	-
MM22	DE31-10164B	MOTOR-SYNCHRONOUS	M2CK34A709-H(B),120V60HZ,34.9r	2	-
MM28	DE80-10113C	BASE-PLATE	SECC1,-,-,-,CM1819,-	1	-
MM29	2501-001114	C-OIL	740nF,2.1KV,BK,54x35x65,20mm	2	-
MM30	DE61-50120A	BRACKET-HVC	SECC,T0.6,W62,L72,-,-,-	2	-
MM31	DE59-70063A	ASSY-HVD	V2M6,P19.0,0.05MT,-,-,-,-,-	2	-
MM32	DE91-70061C	ASSY-H.V.FUSE	THV060T-0700-H,5KV/0.70A,BLE	2	-
MM33	DE26-20162A	TRANS-L.V	SLV-1829E,230,19.7/3.1V,50Hz,4	1	-
MM35	DE32-10013A	SENSOR-THERMISTOR	PT-312-K2,-,-,-,-,-,-	1	-
MM36	DE61-90318A	HOLDER-LAMP	SECC,T0.8,W134,L40.5,-,-,-,-,-	1	-
MM37	DE69-90054A	CLIP-STIRRER	PFA,5mm,CM1819/29,-,-,-	6	-
MM38	DE72-50088A	DUCT-FAN	ALCOAT,T0.5,CM-1819,-,-,-,-,-,	1	-
MM39	DE72-50089A	DUCT-MGT/R	SECC,T0.5,CM-1819,-,-,-,-,-,-	1	-
MM40	DE72-50090A	DUCT-MGT/L	SECC,T0.5,-,-,-,CM-1819,-	1	-
MM41	2301-001204	C-FILM,PEF	1.50uF,-5to+10%,450VAC,-,48x17	1	-
MM43	DE61-30189A	SUPPORTER-FAN-MOUNT	SECC,T1.0,CM-1819,-,-,-,-	1	-
MM44	DE61-50520A	BRACKET-PCB	SECC,T0.8,CM-1819,-,-,-,-	1	-
MM46	DE92-90515A	ASSY-STIRRER	CM-1819,CM-1829,-,-,-,-	2	-
MM47	DE92-90516B	ASSY-BRACKET FILTER	CM1819,-,-,-,-,-	1	-
MM48	DE61-50568A	BRACKET-SUPPORT	SECC/ALCOAT,T0.6,W100,L100,-,C	1	-
MM49	DE71-60422A	COVER-LAMP	STS430,T0.6,CM-1819,-,-,-,-,-	1	-
MM51	DE63-90190B	CUSHION-LAMP	-,T7.0,W100,L120,-,CM1819/29,PUT-FOAM	1	-
MM53	DE01-00095A	FILM-LAMP	PET,T0.15,114,84,CM-1819,-,-,-	1	-
MM55	3601-000448	FUSE-CARTRIDGE	250V,10A,SLOW-BLOW,CERAMIC,6.35x31.8mr	2	-
MM551	3601-001126	FUSE-CARTRIDGE	250V,1.6A,FAST-ACTING,CERAMIC,5x20mm	1	-
MM59	DE71-60421A	COVER-BACK	SECC,T0.6,W481.8,L363.9,CM-181	1	-
MM72	DE61-50541A	BRACKET-EARTH	SGCC2,T1.0,W15,L8,-,-,-	1	-
MM85	DE72-50091A	DUCT-OVEN	STS430,T0.4,CM-1819,-,-,-,-,-	1	-
MM86	DE71-60423A	COVER-STIRRER	PP,CM-1819,-,-,-,-,-,-,-	1	-
MM87	DE93-90112A	ASSY-B/RESISTOR	CM1819/29,-,-,-,-,-	2	-
MM88	DE73-90027A	FERRITE-CORE	NI-ZN,T13.8,W21.0,L28.0,BNF-14	2	H.V.T

7-3 Exploded View & Parts List - Control & Door(CM1219)



No.	Part Code	Description	Specification	Q'ty	Remark
MC01	DE93-30443E	ASSY CONTROL-BOX	-,CM1219-,EUROPE,-,-,-,-,-	1	-
MC06	DE67-40161A	WINDOW-DISPLAY	RESIN-PMMA,82555,CM-1819,-,-,-	1	-
MC07	RC-CM1819-10	ASSY PCB PARTS	CM-121;	1	-
MC09	DE64-10143A	KNOB-POWER	RESIN-ABS,CM-1819,Ni,Cr-platin	1	-
MC11	DE64-10144A	KNOB-TIMER	RESIN-ABS,CM-1819,Ni,Cr-platin	1	-
MC13	DE93-30528A	ASSY CONTROL-PANEL	CM1419/1819,-,-,-,-,-	1	-
MC14	DE66-20211A	BUTTON-SELECT	RESIN-ABS,CM-1829,Ni,Cr-platin	1	-
MC15	DE66-20212A	BUTTON-START	RESIN-ABS,CM-1819,Ni,Cr-platin	1	-
MC16	DE70-30126A	PANEL-BASE	RESIN-ABS,ME,CM-1819,-,-,-,-	1	-
MC17	DE71-60427A	COVER-PANEL	STS430,T0.5,ME,CM-1829,-,-,-	1	-
MC18	DE71-60428B	COVER-PANEL/L	ABS,-,-,-,NICR COATING,CM1019	1	-
MC19	DE71-60429B	COVER-PANEL/R	ABS,-,-,-,NICR COATING,CM1019	1	-
MC20	DE39-40694A	WIRE HARNESS-C	230V50Hz,CM-1819/29,EUROPE,-,-	1	-
MC21	DE39-40695A	WIRE HARNESS-D	230V50Hz,CM-1819,EUROPE,-,-,-	1	-
MC22	DE39-40692A	WIRE HARNESS-B	230V50HZ,CM1819/29,EUROPE,-,-,	1	-
MD01	DE92-40241L	ASSY DOOR	CM1219,-,STS430,1200W	1	-
MD04	DE92-50132B	ASSY DOOR-E	CM-1819,COATING,BLK,-,-,-,-	1	-
MD06	DE64-40298A	DOOR-C	PP,CM-1819,-,-,-,-,-	1	-
MD07	DE61-70144A	SPRING-KEY	PI6.5,D0.8,-,-,-,CM-1819,-	2	-
MD08	DE61-80138A	HINGE	SCP1,T3.0,W24.5,L29.5,-,-,-,-,	2	-
MD10	DE64-40296A	DOOR-KEY	CR3C,-,-,-,-,-,-	2	-
MD13	DE60-60080A	PIN-KEY	A,M3.95,L21,STS304,-,CM-1819,-	2	DOOR-E
MD14	DE64-20123A	HANDLE	ZN-DICASTING,500G,CM-1819,-,CM	1	-
MD15	DE64-90145A	DECORATION-DOOR	ABS,CM-1819,-,-,-,-,-,-,-	1	-
MD16	DE64-90146A	DECORATION-COV/DOOR	STS,CM-1819,-,-,-,-,-,-,-	1	-
MD17	DE67-20174A	SCREEN-DOOR(B)	TEMP-GLASS,T3.2,-,-,-,-,-,-,-	1	-
MD18	DE71-60433A	COVER-HANDLE	STS430,T0.5,CM-1819,-,-,-,-,-,	1	-

7-3 Exploded View & Parts List - Control & Door(CM1229)



No.	Part Code	Description	Specification	Q'ty	Remark
MC01	DE93-30442B	ASSY CONTROL-BOX	-,CM1229,-,EUROPE,-,-,-,-,-,-	1	-
MC02	DE34-00034A	SWITCH-MEMBRANE	PET,CM1229/XEU,230V50Hz,-,-,-	1	-
MC06	DE67-40161A	WINDOW-DISPLAY	RESIN-PMMA,82555,CM-1819,-,-,-	1	-
MC07	RC-CM1819-11	ASSY PCB PARTS	CM-122;	1	-
MC13	DE93-30529C	ASSY CONTROL-PANEL	CM1229,-,EUROPE,-,-,-,-,-,-	1	-
MC15	DE66-20212A	BUTTON-START	RESIN-ABS,CM-1819,Ni,Cr-platin	1	-
MC16	DE70-30125A	PANEL-BASE	RESIN-ABS,TC,CM-1829,-,-,-,-,-	1	-
MC17	DE71-60426A	COVER-PANEL	STS430,T0.5,TC,CM-1829,-,-,-,-	1	-
MC18	DE71-60428B	COVER-PANEL/L	ABS,-,-,-,NICR COATING,CM1019	1	-
MC19	DE71-60429B	COVER-PANEL/R	ABS,-,-,-,NICR COATING,CM1019	1	-
MC20	DE39-40694A	WIRE HARNESS-C	230V50Hz,CM-1819/29,EUROPE,-,-	1	-
MC22	DE39-40692A	WIRE HARNESS-B	230V50HZ,CM1819/29,EUROPE,-,-,	1	-
MC27	DE39-40113B	WIRE HARNESS-F	100V,50/60HZ,RE-CH1,-,-,-	1	-
MD01	DE92-40214M	ASSY DOOR	CM1229,-,STS430,1200W-,-,-	1	-
MD04	DE92-50132B	ASSY DOOR-E	CM-1819,COATING,BLK,-,-,-,-	1	-
MD06	DE64-40298A	DOOR-C	PP,CM-1819,-,-,-,-,-	1	-
MD07	DE61-70144A	SPRING-KEY	PI6.5,D0.8,-,-,-,CM-1819,-	2	-
MD08	DE61-80138A	HINGE	SCP1,T3.0,W24.5,L29.5,-,-,-,-,	2	-
MD10	DE64-40296A	DOOR-KEY	CR3C,-,-,-,-,-,-	2	-
MD13	DE60-60080A	PIN-KEY	A,M3.95,L21,STS304,-,CM-1819,-	2	DOOR-E
MD14	DE64-20123A	HANDLE	ZN-DICASTING,500G,CM-1819,-,CM	1	-
MD15	DE64-90145A	DECORATION-DOOR	ABS,CM-1819,-,-,-,-,-,-,-	1	-
MD16	DE64-90146A	DECORATION-COV/DOOR	STS,CM-1819,-,-,-,-,-,-,-	1	-
MD17	DE67-20174A	SCREEN-DOOR(B)	TEMP-GLASS,T3.2,-,-,-,-,-,-,-	1	-
MD18	DE71-60433A	COVER-HANDLE	STS430,T0.5,CM-1819,-,-,-,-,-,	1	-

7-6 Parts List - Standard Parts(CM1219)

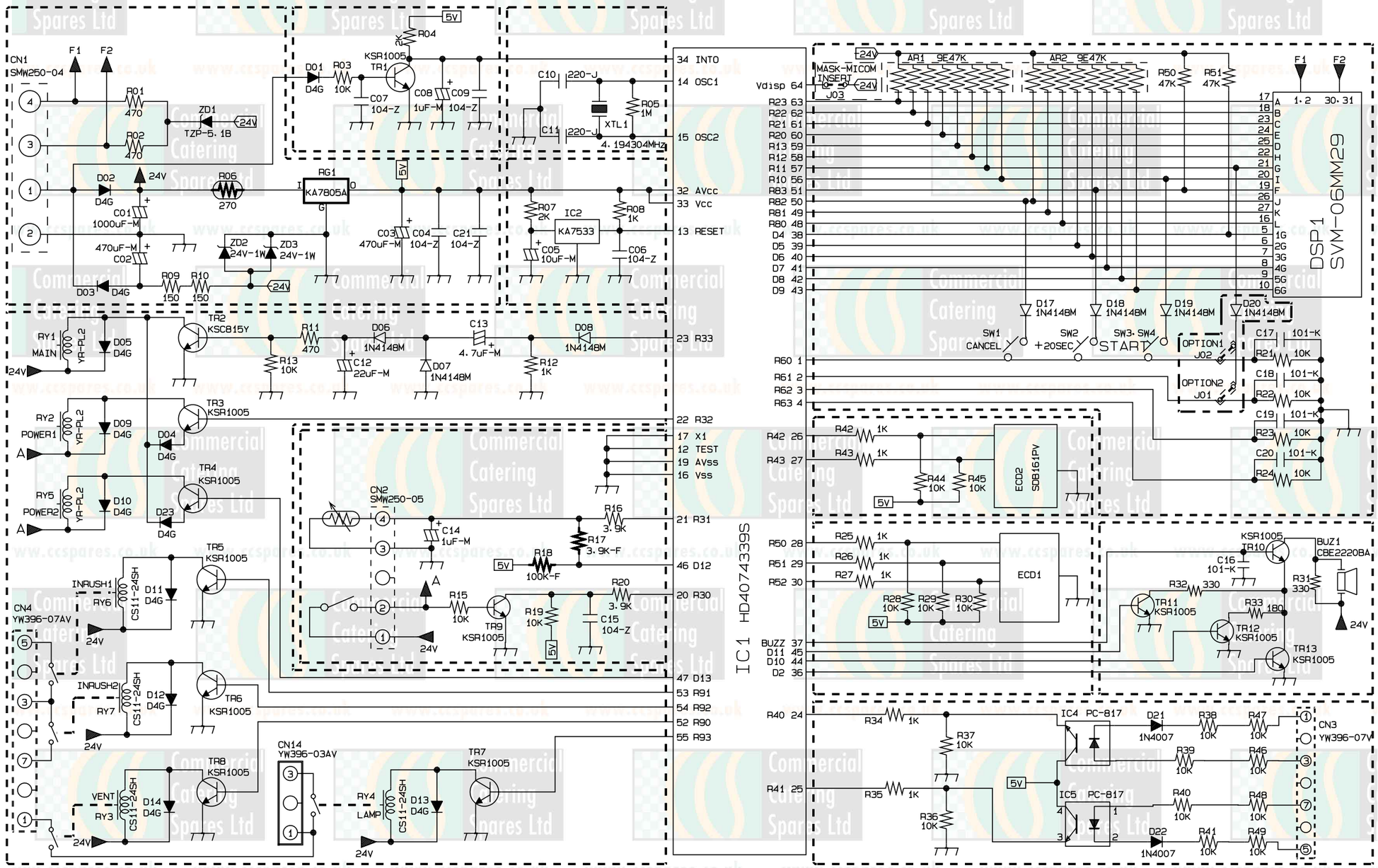
Part Code	Description	Specification	Remark
6011-001140	BOLT-STUD	M4,L8,Ni PLT,BSW	-
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	BACK-COVER
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	BKT-LAMP
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	LVT
DE60-10012A	SCREW-TAP TITE	TH,+,3,M4,L10,SWR10,ZPC2,TOOTH	P/CORD EARTH
DE60-10080B	SCREW-WASHER	PH,PI5,L10,SWRCH18A,ZP2,2S,-,-	HVT
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,	BODY-LATCH
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,	C-PANEL
DE60-10088A	SCREW-TAP PH	PH,M3,L8,FEFZY,PLAIN,-,-,-,-	MAIN PCB
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	BKT-HIN-L
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	BKT-HIN-U
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	BKT-MOTOR
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	DUCT-FAN
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	DUCT-MGT-L
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	DUCT-MGT-R
DE60-10196A	SCREW-TAP OH	OH+FH,+,-,4,L8,MSWR18C,Ni,SIL,	BASE
DE60-10196A	SCREW-TAP OH	OH+FH,+,-,4,L8,MSWR18C,Ni,SIL,	COVER-LAMP
DE60-10196A	SCREW-TAP OH	OH+FH,+,-,4,L8,MSWR18C,Ni,SIL,	OUTPANEL
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	BACK-COVER
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	BKT-PCB
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	C-RESISTOR
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	CAVI-BACK
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	DUCT-MGT-L
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	DUCT-MGT-R
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	DUCT-OVEN
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	OUTPANEL
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	SUP-FAN
DE60-10199A	SCREW-WASHER	TH(WASHER),+,-,4,L10,MSWR18C,N	THERMISTOR
DE60-20014A	BOLT-FLANGE	M5,L10,MSWR3,FEFZY,-,-,-,-,-	-
DE60-30015A	NUT-FLANGE	M5,P0.8,MSWR10,FEFZY,-,-,-,-,-	MGT
DE60-10082H	SCREW-A	2S-4X12,TOOTHED,-,-,-,-,-,-,	-
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	-
DE60-10098A	SCREW-ASSY TAP TITE	PH,TC,M4X8,SWRCH18A,ZPC2,GLD,W	HANDLE
DE60-10121A	SCREW-TAP TH	2-4X8,FE,FZY,(77128-540-081,SA	DECORATION
DE60-10022A	SCREW-PH	PH,+,M3,L8,MSWR10,FEFZY,-,-,-,	TCO-DUCT
DE60-10088A	SCREW-TAP PH	PH,M3,L8,FEFZY,PLAIN,-,-,-,-,-	PCB

7-7 Parts List - Standard Parts(CM1229)

Part Code	Description	Specification	Q'ty	Remark
6011- 001140	BOLT- STUD	M4, L8, Ni PLT, BSW	2	-
DE60- 10012A	SCREW- TAP TITE	TH, +, 3, M4, L10, SWR10, ZPC2, TOOTH	1	BACK- COVER
DE60- 10012A	SCREW- TAP TITE	TH, +, 3, M4, L10, SWR10, ZPC2, TOOTH	1	BKT- LAMP
DE60- 10012A	SCREW- TAP TITE	TH, +, 3, M4, L10, SWR10, ZPC2, TOOTH	1	LVT
DE60- 10012A	SCREW- TAP TITE	TH, +, 3, M4, L10, SWR10, ZPC2, TOOTH	1	P/C EARTH
DE60- 10080B	SCREW- WASHER	PH, PI5, L10, SWRCH18A, ZP2, 2S, - , -	8	HVT
DE60- 10082H	SCREW- A	2S- 4X12, TOOTHED, - , - , - , - , - , - ,	2	BODY- LATCH
DE60- 10082H	SCREW- A	2S- 4X12, TOOTHED, - , - , - , - , - , - ,	3	C- PANEL
DE60- 10088A	SCREW- TAP PH	PH, M3, L8, FEFZY, PLAIN, - , - , - , - , -	4	MAIN PCB
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	1	BKT- HIN- L
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	1	BKT- HIN- U
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	2	BKT- MOTOR
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	2	DUCT- FAN
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	1	DUCT- MGT- L
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	1	DUCT- MGT- R
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	1	MEM EARTH
DE60- 10194A	SCREW- TAPPING	PH, +, 2S, M3, L12, MSWR12, ZPC2, PLA	2	-
DE60- 10196A	SCREW- TAP OH	OH+FH, +, - , 4, L8, MSWR18C, Ni, SIL,	3	BASE
DE60- 10196A	SCREW- TAP OH	OH+FH, +, - , 4, L8, MSWR18C, Ni, SIL,	1	COVER- LAMP
DE60- 10196A	SCREW- TAP OH	OH+FH, +, - , 4, L8, MSWR18C, Ni, SIL,	4	OUTPANEL
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	8	BACK- COVER
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	2	BKT- PCB
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	2	C- RESISTOR
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	4	CAVI- BACK
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	1	DUCT- MGT- L
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	1	DUCT- MGT- R
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	2	DUCT- OVEN
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	7	OUTPANEL
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	2	SUP- FAN
DE60- 10199A	SCREW- WASHER	TH(WASHER), +, - , 4, L10, MSWR18C, N	1	THERMISTOR
DE60- 20014A	BOLT- FLANGE	M5, L10, MSWR3, FEFZY, - , - , - , - , -	4	-
DE60- 30015A	NUT- FLANGE	M5, P0.8, MSWR10, FEFZY, - , - , - , - , -	8	MGT
DE60- 10082H	SCREW- A	2S- 4X12, TOOTHED, - , - , - , - , - , - ,	5	-
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	4	-
DE60- 10098A	SCREW- ASSY TAP TITE	PH, TC, M4X8, SWRCH18A, ZPC2, GLD, W	2	HANDLE
DE60- 10121A	SCREW- TAP TH	2- 4X8, FE, FZY, (77128- 540- 081, SA	3	DECORATION
DE60- 10022A	SCREW- PH	PH, +, M3, L8, MSWR10, FEFZY, - , - , - ,	1	TCO- DUCT
DE60- 10088A	SCREW- TAP PH	PH, M3, L8, FEFZY, PLAIN, - , - , - , - , -	2	-
DE60- 10088A	SCREW- TAP PH	PH, M3, L8, FEFZY, PLAIN, - , - , - , - , -	2	PCB

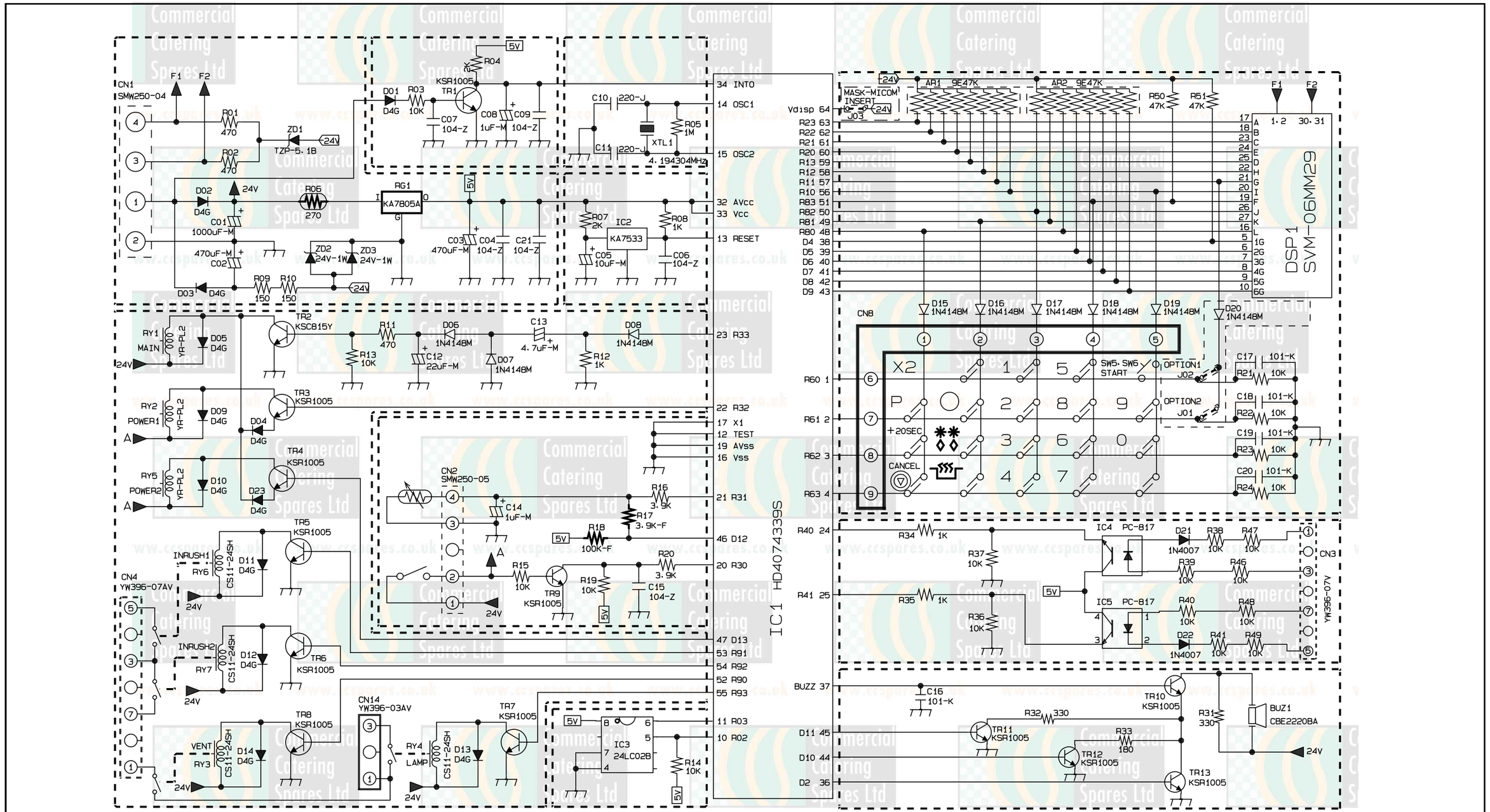
8. P.C.B Circuit Diagrams and Parts List

8-1 P.C.B Circuit Diagram (CM1219)



MODEL-OPTION			
MODEL	INSERT	DELETE	REMARK
CM1219	D20, J02		

8-2 P.C.B Circuit Diagram (CM1229)



MODEL-OPTION			
MODEL	INSERT	DELETE	REMARK
CM1429	D20, J02		

8-3 P.C.B Parts List (CM1219)

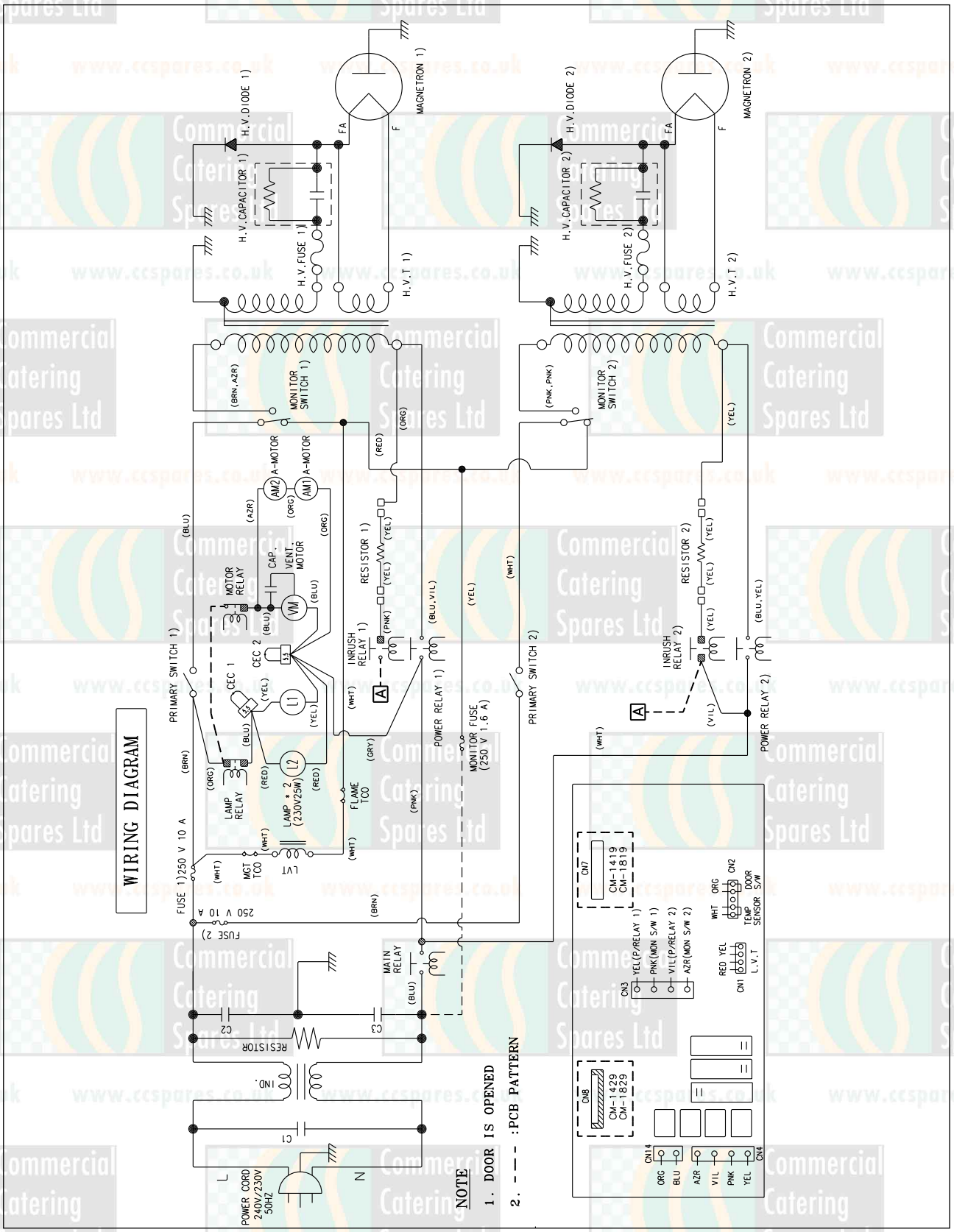
Part Code	Description	Specification	Q'ty	Remark
0604-000237	PHOTO-COUPLER	TR,50-600%,200mW,DIP-4,ST	2	IC4,IC5
3002-000198	BUZZER-PIEZO	80dB,-,-,4KHz,ST	1	BUZ1
3406-001031	SWITCH-ROTARY	10V,1mA,DP24T,18.3mm	1	ECD2
3406-001032	SWITCH-ROTARY	28VDC,10mA,DP6T,20mm	1	ECD1
3501-001015	RELAY-POWER	24V,21.8mA,16A,1FormA,20mS,10m	3	RY1,2,5
3501-001016	RELAY-MINIATURE	24V,12.5mA,5A,1FormA,8mS,4mS	4	RY3,4,6,7
3711-000315	CONNECTOR-HEADER	1WALL,7P,1R,3.96mm,STRAIGHT,SN	2	CN3,CN4
3711-000570	CONNECTOR-HEADER	BOX,10P,1R,2.50mm,ANGLE,SN	1	CN10
3711-000577	CONNECTOR-HEADER	BOX,10P,1R,2.5mm,STRAIGHT,SN	1	CN7
3711-000616	CONNECTOR-HEADER	BOX,11P,1R,2.5mm,STRAIGHT,SN	2	CN5,CN12
3711-001154	CONNECTOR-HEADER	BOX,9P,1R,2.5mm,STRAIGHT,SN	2	CN6,CN11
DE07-10088A	V.F.DISPLAY	SVM-06MM29,REDDISHORG/GRN,6G,5	1	DSP1
DE09-00117A	IC-MCU	HD4074339SI-,-,32K SDIP-64PIN,-	1	IC1
DE13-20016A	IC-VOLT REGU	KA7805A,TO-220AB,1A,0/125C,-,-	1	RG1
DE61-90178A	HOLDER-DIGITRON	NY66,CM-1819,-,-,-,-,-,-	1	DSP1
0401-001025	DIODE-SWITCHING	1N4148M,50V,450mA,DO-34,TP	7	D06~08,17~20
0402-000137	DIODE-RECTIFIER	1N4007,1000V,1A,DO-41,TP	2	D21,22
0402-001103	DIODE-RECTIFIER	1T4,400V,1A,TS-1,TP	12	D01~5,9~14,23
0403-000525	DIODE-ZENER	1N4733A,5.1V,5%,1W,DO-41,TP	1	ZD1
0403-000537	DIODE-ZENER	1N4749A,24V,5%,1W,DO-41,TP	2	ZD2,ZD3
0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120-	1	TR2
0504-001045	TR-DIGITAL	KRC119M,NPN,400MW,4.7K/10K,TO-92M	12	TR1,3~9,10~13
2001-000003	R-CARBON	330ohm,5%,1/8W,AA,TP,1.8x3.2mm	2	R31,32
2001-000290	R-CARBON	10KOHM,5%,1/8W,AA,TP,1.8X3.2MM	14	R03,13,15,19,21~24,28~30,36,37,44,45
2001-000405	R-CARBON	180OHM,5%,1/8W,AA,TP,1.8X3.2MM	1	R33
2001-000429	R-CARBON	1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	9	R08,12,25~27,34,35,42,43
2001-000435	R-CARBON	1MOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	R05
2001-000577	R-CARBON	2KOHM,5%,1/8W,AA,TP,1.8X3.2MM	2	R04,07
2001-000613	R-CARBON	3.9KOHM,5%,1/8W,AA,TP,1.8X3.2MM	2	R16,20
2001-000780	R-CARBON	470OHM,5%,1/8W,AA,TP,1.8X3.2MM	3	R01,02,11
2001-000786	R-CARBON	47KOHM,5%,1/8W,AA,TP,1.8X3.2MM	2	R50,R51
2001-001077	R-CARBON(S)	150OHM,5%,1/2W,AA,TP,2.4X6.4MM	2	R09,10
2003-000236	R-METAL OXIDE	270ohm,5%,2W,AA,TP,6x16mm	1	R06
2003-000462	R-METAL OXIDE(S)	10Kohm,5%,2W,AA,TP,4x12mm	8	R38~41,46~49
2004-000195	R-METAL	100Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	R18
2004-000729	R-METAL	3.9Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	R17
2011-000582	R-NETWORK	47Kohm,5%,1/8W,A,SIP,9P,BK	2	AR1,2
2202-000121	C-CERAMIC,MLC-AXIAL	100pF,10%,50V,Y5P,TP,1.9x3.5,-	5	C16~20
2202-000205	C-CERAMIC,MLC-AXIAL	22pF,5%,50V,SL,TP,1.9x3.5,-	2	C10,11
2202-000780	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,TP,3.5x1	6	C04,6,7,9,15,21
2401-000037	C-AL	470uF,20%,16V,GP,TP,8x11.5,5	1	C03
2401-000180	C-AL	1000uF,20%,35V,GP,-,16x25x7.5m	1	C01
2401-000466	C-AL	10uF,20%,35V,GP,TP,5x7,5	1	C05
2401-000598	C-AL	1uF,20%,50V,GP,TP,4x7,5	2	C08,C14
2401-000914	C-AL	22uF,20%,16V,GP,TP,5x11,5	1	C12
2401-001415	C-AL	470uF,20%,35V,GP,TP,10x20,5	1	C02
2401-002075	C-AL	4.7uF,20%,50V,GP,TP,5x11,5	1	C13
2801-003214	CRYSTAL-UNIT	4.194304MHz,50ppm,28-AAA,12pF,	1	XTL1
3404-001022	SWITCH-TACT	15V,20mA,130±40gf,6x6x5mm,SPS	4	SW1~4
3711-000203	CONNECTOR-HEADER	1WALL,3P,1R,3.96MM,STRAIGHT,SN	1	CN14
3711-000940	CONNECTOR-HEADER	BOX,4P,1R,2.5mm,STRAIGHT,SN	1	CN1
3711-000999	CONNECTOR-HEADER	BOX,5P,1R,2.5mm,STRAIGHT,SN	1	CN2
DE13-20009A	IC	KA7533,DIP,-,-,-,-,-	1	IC2
DE39-60001A	WIRE-SO COPPER	PI0.6,SN,T,52MM,TAPING_WIRE,-	37	J02~38

8-4 P.C.B Parts List(CM1229)

Part Code	Description	Specification	Q'ty	Remark
3501-001015	RELAY-POWER	24V,21.8mA,16A,1FormA,20mS,10m	3	RY1.2.5
0604-000237	PHOTO-COUPLER	TR,50-600%,200mW,DIP-4,ST	1	IC4.5
3002-000198	BUZZER-PIEZO	80dB,-,-,4KHz,ST	1	BUZ1
3501-001016	RELAY-MINIATURE	24V,12.5mA,5A,1FormA,8mS,4mS	4	RY3,4,6,7
3708-000525	CONNECTOR-FPC/FC/F	10P,2.54mm,STRAIGHT,SN	1	CN8
3711-000315	CONNECTOR-HEADER	1WALL,7P,1R,3.96mm,STRAIGHT,S	2	CN3,4
3711-000616	CONNECTOR-HEADER	BOX,11P,1R,2.5mm,STRAIGHT,SN	1	CN5
3711-001154	CONNECTOR-HEADER	BOX,9P,1R,2.5mm,STRAIGHT,SN	2	CN11,6
DE07-10088A	V.F.DISPLAY	SVM-06MM29,REDDISHORG/GRN,(	1	DSP1
DE09-00117A	IC-MCU	HD4074339SI-,-,804S,CM1829,-	1	IC1
DE13-20016A	IC-VOLT REGU	KA7805A,TO-220AB,1A,0/125C,-,-	1	RG1
0401-001002	DIODE-SWITCHING	1N4148M,100V,200mA,DO-34,TP	8	D06~8,15~19
0402-000137	DIODE-RECTIFIER	1N4007,1000V,1A,DO-41,TP	2	D21,22
0402-001103	DIODE-RECTIFIER	1T4,400V,1A,TS-1,TP	12	D01~5,9~14,23
0403-000525	DIODE-ZENER	1N4733A,5.1V,5%,1W,DO-41,TP	1	ZD1
0403-000537	DIODE-ZENER	1N4749A,24V,5%,1W,DO-41,TP	2	ZD2,3
0501-000389	TR-SMALL SIGNAL	KSC815,NPN,400mW,TO-92,TP,120	1	TR2
0504-001045	TR-DIGITAL	KRC119M,NPN,400MW,4.7K/10K,TC	11	TR1,3~12
1103-001107	IC-EEPROM	24C021C,256x8Bit,DIP,8P,300MIL,-,	1	IC3
2001-000003	R-CARBON	330ohm,5%,1/8W,AA,TP,1.8x3.2mm	2	R31,32
2001-000290	R-CARBON	10KOHM,5%,1/8W,AA,TP,1.8X3.2MI	11	R03,13~15,19,21~24,36,37
2001-000405	R-CARBON	180OHM,5%,1/8W,AA,TP,1.8X3.2MI	1	R33
2001-000429	R-CARBON	1KOHM,5%,1/8W,AA,TP,1.8X3.2MM	4	R08,12,34,35
2001-000435	R-CARBON	1MOHM,5%,1/8W,AA,TP,1.8X3.2MM	1	R05
2001-000577	R-CARBON	2KOHM,5%,1/8W,AA,TP,1.8X3.2MM	2	R04,07
2001-000613	R-CARBON	3.9KOHM,5%,1/8W,AA,TP,1.8X3.2M	2	R16,20
2001-000780	R-CARBON	470OHM,5%,1/8W,AA,TP,1.8X3.2MI	3	R01,02,11
2001-000786	R-CARBON	47KOHM,5%,1/8W,AA,TP,1.8X3.2MI	2	R50,51
2001-001077	R-CARBON(S)	150OHM,5%,1/2W,AA,TP,2.4X6.4MI	2	R09,10
2003-000236	R-METAL OXIDE	270ohm,5%,2W,AA,TP,6x16mm	1	R06
2003-000462	R-METAL OXIDE(S)	10Kohm,5%,2W,AA,TP,4x12mm	8	R38~41,46~49
2004-000195	R-METAL	100Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	R18
2004-000729	R-METAL	3.9Kohm,1%,1/8W,AA,TP,1.8x3.2m	1	R17
2011-000582	R-NETWORK	47Kohm,5%,1/8W,A,SIP,9P,BK	2	AR1,2
2202-000121	C-CERAMIC,MLC-AXIAL	100pF,10%,50V,Y5P,TP,1.9x3.5,-	5	C16~20
2202-000205	C-CERAMIC,MLC-AXIAL	22pF,5%,50V,SL,TP,1.9x3.5,-	2	C10,11
2202-000780	C-CERAMIC,MLC-AXIAL	100nF,+80-20%,50V,Y5V,TP,3.5x1	6	C04,06,07,09,15,21
2401-000037	C-AL	470uF,20%,16V,GP,TP,8x11.5,5	1	C03
2401-000180	C-AL	1000uF,20%,35V,GP,-,16x25x7.5m	1	C01
2401-000466	C-AL	10uF,20%,35V,GP,TP,5x7,5	1	C05
2401-000598	C-AL	1uF,20%,50V,GP,TP,4x7,5	2	C08,14
2401-000914	C-AL	22uF,20%,16V,GP,TP,5x11,5	1	C12
2401-001415	C-AL	470uF,20%,35V,GP,TP,10x20,5	1	C02
2401-002075	C-AL	4.7uF,20%,50V,GP,TP,5x11,5	1	C13
2801-003214	CRYSTAL-UNIT	4.194304MHz,50ppm,28-AAA,12pF,	1	XTL1
3404-001022	SWITCH-TACT	15V,20mA,130 ¡¾40gf,6x6x5mm,SPS	2	SW5,6
3711-000203	CONNECTOR-HEADER	1WALL,3P,1R,3.96MM,STRAIGHT,S	1	CN14
3711-000881	CONNECTOR-HEADER	BOX,3P,1R,2.5mm,STRAIGHT,SN	2	CN13,9
3711-000940	CONNECTOR-HEADER	BOX,4P,1R,2.5mm,STRAIGHT,SN	1	CN1
3711-000999	CONNECTOR-HEADER	BOX,5P,1R,2.5mm,STRAIGHT,SN	1	CN2
DE13-20009A	IC	KA7533,DIP,-,-,-,-,-	1	IC2
DE39-60001A	WIRE-SO COPPER	PI0.6,SN,T,52MM,TAPING_WIRE,-,	34	J04~06,08~38

9. Wiring Diagram & Operating Sequence

9-1 Wiring Diagram (CM1219/1229)



9-2 Description of Operating Sequence

When the oven is set to power level of 100%, 70% or 50%

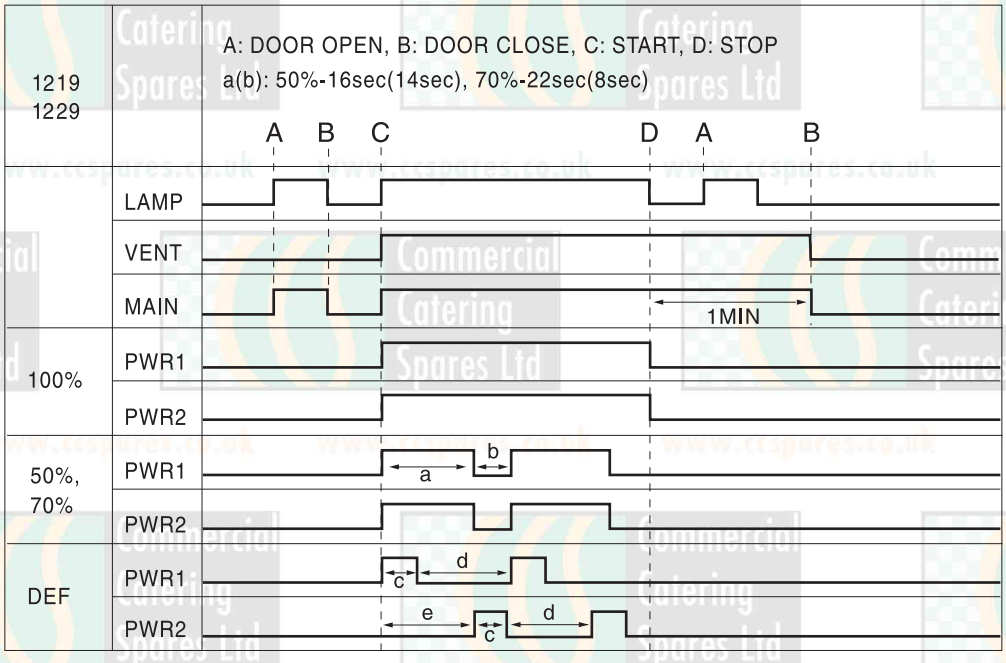
When the oven is operating under the power level of 100%, 70% or 50%, the coil of power relay 1 and 2 are energized intermittently by ON and OFF cycle of 30 seconds in order to supply power source to the High Voltage Transformer and thus to oscillate the magnetron.

When the oven is set to DEFROST power position

When the oven is set to DEFROST power position, the coil of power relay 1 and 2 is programmed to operate not together but alternately. That means power relay 1 should not work when the power relay 2 does(or relay 2 should not work when the power relay 1 does). The power realy 1 is energized for 15 seconds and then the power relay 2 is energized for 15 seconds in turn. One complete ON and OFF cycle time of the power relay 1 and 2 is 30 seconds.

The relation between indications on the display window and the output power of the microwave oven is as shown in figure below.

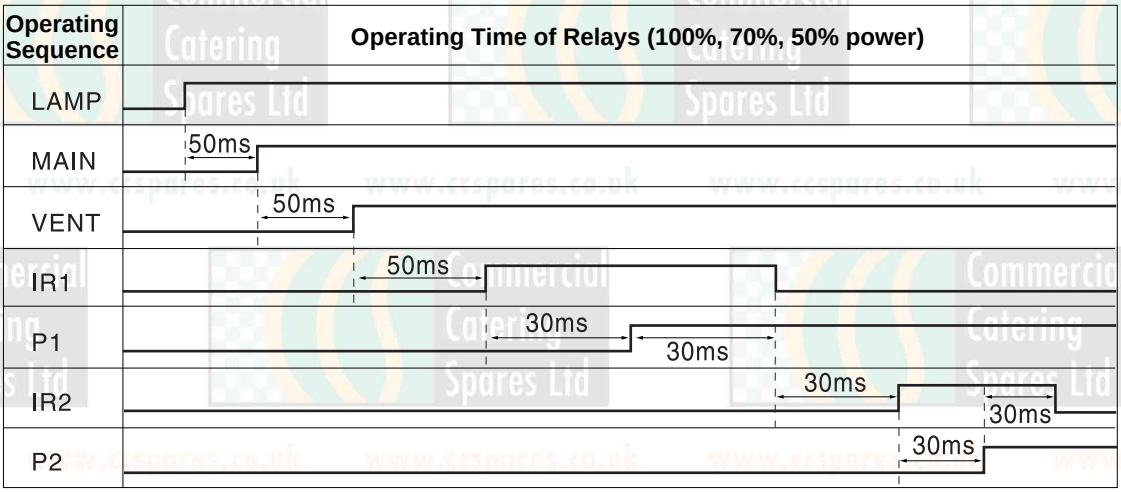
	CM1219 / CM1229
c(d):	30% -> opt short - 9sec(6sec) 15% -> opt short - 5sec(10sec)
e:	15sec
Note: One second included as a time for starting the magnetron oscillation	



9-2 Description of Operating Sequence (continued)

Initial operating status of Power Relay when the START button is pressed.

Relays are designed to work as shown in the figure below.
When the oven is set to DEFROST power position, Inrush Relay1 and Power Relay1 are programmed to work with Inrush Relay2 and Power Relay2 not simultaneously but alternately.



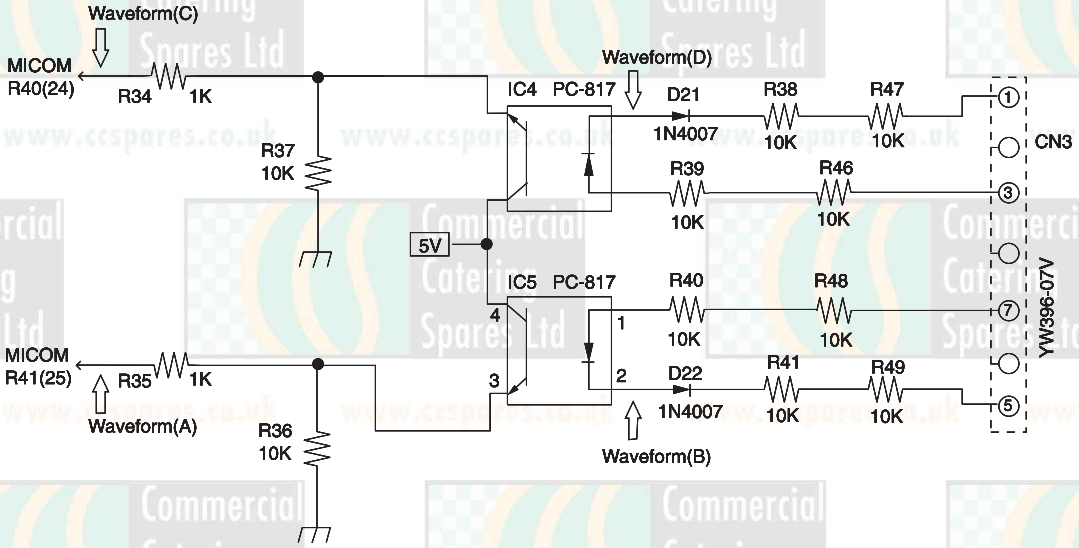
NOTE :

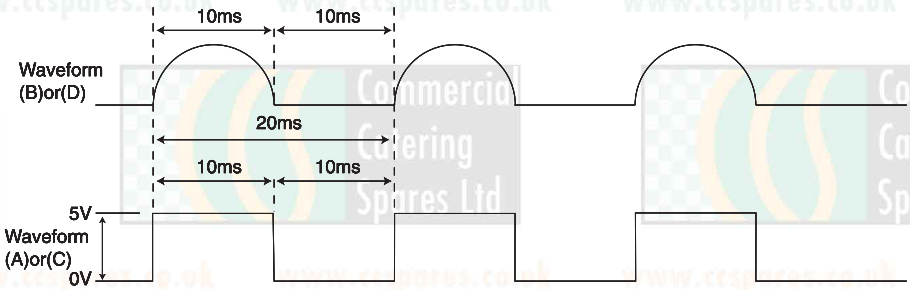
LAMP: Lamp Relay (250V 5A)
MAIN: Main Relay (250V 16A)
VENT: Ventilation Motor Relay (250V 5A)
IR1: Inrush Relay1 (250V 5A)
IR2: Inrush Relay2 (250V 5A)
P1: Power Relay1 (250V 16A)
P2: Power Relay2 (250V 16A)

9-2 Description of Operating Sequence (continued)

High Voltage Transformer input power sensing circuitry

Refers to the circuitry that detects and check if the input power is correctly supplied to the primary terminal of High Voltage Transformer when the microwave oven is operating. If any abnormal condition(eg. Micro S/W, Relay open) is detected, the error code (E41, E42) shows on the display window. When the error code appears in the display window, check the waveform(A), (B), (C),or (D).
In case of Power Relay 1 (RY2), check the waveform (A), (B) below.
In case of Power Relay 2 (RY5), check the waveform (C), (D) below.





ELECTRONICS

© Samsung Electronics Co., Ltd.
MAY 2000
Printed in Korea
Code No : DE68-01157A